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ABSTRACT

A study examined the relationship between the self-efficacy and career aspirations of 37,942 11th-grade students across the state of Pennsylvania. Using Albert Bandura's theory of self-efficacy, which states that the level and strength of self-efficacy of an individual will determine (1) whether or not the individual will initiate coping behavior, (2) the amount of effort that the individual will expend, and (3) the length of time that the individual will sustain coping efforts in the face of obstacles, the study compared the career aspirations of high school juniors from rural, urban, and suburban areas based on whether the students were from traditional, dual-career, or single-parent family units. Pennsylvania's 1981 Educational Quality Assessment Program, was used to gather data for the study. The suburban students were consistently the most self-efficacious, followed by the urban and then by the rural youth as the least self-efficacious. For familial situations, dual-career families proved to be the most self-efficacious followed by traditional and, finally, by single-parent families. Females were consistently less self-efficacious than males with the exception of females from single-parent families. (This dissertation includes 40 tables, the assessment instrument, and a chart dealing with condition variables.) (MN)

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The Pennsylvania State University

The Graduate School

Division of Occupational and Vocational Studies

Self-Efficacy as Related to Career Aspirations Based on the Educational Quality Assessment Inventory

A Thesis in

Vocational Education

by

Donna J. Dentler

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

December 1984

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ABSTRACT

Albert Bandura's theory of self-efficacy was applied in an investigation of differences in vocational behavior of 11th grade students in Pennsylvania in three socio-economic environments--rural, suburban and urban--and in three family situational environments--traditional, dual career and single parent family units. Each major group was also analyzed for perceptions of self-efficacy based upon the factors that seemed appropriate to the study according to self-efficacy theory. In addition, comparisons between males and females were made.

The 1981 Educational Quality Assessment Program, a state-wide program administered through the Pennsylvania Department of Education, was used as a source of data because it seemed to utilize several goal areas and condition variables which could be identified as related to increased understanding of the concept of self-efficacy. Specifically, self-efficacy was defined as the belief that a person has that one can attain certain levels of vocational goals and that one can envision themselves acquiring the necessary education to reach those goals. Thus, a proxy measure of self-efficacy expectations was a comparison between occupational desire and occupational expectations. The goal areas and condition variables which were identified by the study as contributing factors to self-efficacy expectations were self-esteem, career awareness, creative opportunities, parental education, parental occupation, parental expectations, educational expectations, and teacher expectations. Only the 11th grade sample was used resulting in a sample of 37,942.

Significant differences were found in self-efficacy expectations of students from the total populations between rural, suburban and urban samples; between traditional, dual career and single parent families; and between males and females. Females were consistently found less self-efficacious except for those in the single parent sample. In terms of residence, suburban was consistently the highest for self-efficacy expectations followed by urban and then rural as the least self-efficacious. For familial situations, the dual career proved the most self-efficacious followed by traditional and, finally, single parent families. In the female sample, it appeared that differences in self-efficacy expectations may be more a result of environmental situation than family situation, as evidenced by the occupational status of the parents.

In a regression analysis of the factors identified as possibly contributing to self-efficacy perceptions, parental expectations was the least significant variable with teacher expectations showing a more significant contribution. The analysis also suggested that parental occupation, educational expectations of the students, and career awareness are important in fostering higher levels of self-efficacy.

The data support the assumptions of the study that (1) rural populations are less self-efficacious than either suburban or urban populations, (2) that subjects from dual career family situations are more self-efficacious than those from traditional or single parent families, and (3) that females are less self-efficacious than males.

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CHAPTER I

BACKGROUND OF THE STUDY

Introduction

Self-efficacy is a relatively new concept in social learning theory. Bandura's theory (1977a) states that the level and strength of self-efficacy will determine (1) whether or not a coping behavior will be initiated, (2) how much expenditure of effort will result, and (3) how long the effort will be sustained in the face of obstacles. The model proposes four principal sources from which expectations of self-efficacy are derived: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. While most of Bandura's research has been with phobics, the theory has implications for more generalized applications. One such application might be in determining the importance of self-efficacy in vocational behavior.

Significance of the Study

Research is needed to investigate Bandura's self-efficacy theory as a possible influence on the vocational aspirations of women. Because women have theoretically been less or differently exposed than men to the four sources of information pertinent to the development of efficacy expectations, it has been postulated that self-efficacy in women is lower than that of men. Furthermore, it is reasonable to

hypothesize that the level of self-efficacy also differs according to environmental situations. It is the purpose of this study to investigate Bandura's self-efficacy theory of social learning as a possible influence in the vocational aspirations of women in several environmental situations and to determine whether there is a further difference as a result of the vocational status of the parents.

Hackett and Betz (1981) introduced the idea of a self-efficacy approach as being particularly relevant to the understanding of the career development of women. They have studied the applicability of Bandura's self-efficacy theory in relation to career decision making and have investigated the importance of self-efficacy in understanding the internal and external barriers to women's career development. The results of their research indicate significant and consistent sex differences in self-efficacy with regard to traditional and non-traditional occupations. They propose that access and exposure to the four sources of information pertinent to the development of efficacy expectations (performance accomplishments, vicarious learning, emotional arousal, and verbal persuasion) be used in designing intervention strategies to increase, strengthen, and generalize self-efficacy within the framework of the career development of women. Therefore, an understanding of the concept of self-efficacy as a possible determinant of career aspirations seems appropriate and very applicable to the enhancement of vocational education as a viable educational alternative for women students and to the development of programs which would encourage women to select vocational education as a means by which they could achieve those aspirations.

Not only are differences in self-efficacy found between men and women (Betz and Hackett, 1981), but it seems reasonable to assume that there are differences among women from different socio-economic backgrounds. Rural women are, like their metro counterparts, becoming more involved in vocational activities outside the home, but in most cases, rural women are engaged in low-wage, low-skill and low-status occupations (U.S. Bureau of the Census, 1978). It is possible that this phenomenon can be explained by Bandura's self-efficacy theory. Furthermore, because of the socialization processes which determine levels of self-efficacy, it is possible that differences may be found as a result of the role modeling of parents from different family situations, i.e., traditional, dual career, or single parent. The proposed investigation is concerned with the family situations of women students because of the variability of parental participation in the work force.

Statement of the Problem

The purpose of this research is to determine if there are differences in levels of self-efficacy in women and men from rural, suburban, and urban populations and from different family backgrounds. Findings emanating from the research could have significant implications to vocational education by contributing a vehicle by which to study, predict, and enhance the vocational behavior of students within the state of Pennsylvania.

Objectives

This research project seeks to apply Albert Bandura's theory of self-efficacy to the vocational behavior of students in three socio-economic environments--rural, suburban, and urban--to determine if there are differences in perceived self-efficacy among the three groups. Furthermore, the investigation seeks to determine if there are differences between family situations--traditional, dual career, and single-parent parental units.

Using data from the 1981 administration of the Educational Quality Assessment Inventory and particularly the data on eleventh grade students in the state of Pennsylvania, the following questions are addressed:

1. Is there a difference in self-efficacy expectations among 11th grade students from different socio-economic environments, specifically rural, suburban and urban?

2. Is there a difference in self-efficacy expectations among these same students based upon different family backgrounds in terms of parental participation in the workforce--traditional, dual career, and single parent?

3. Is there a difference in self-efficacy expectations between males and females?

4. Is there a difference in self-efficacy expectations within the subgroups--rural, suburban, urban, traditional, dual career and single parent--as a result of identified factors inherent to each group?

5. Is there a correlation between certain condition variables and goal areas measured by the EQA and predictors of self-efficacy, i.e., self-esteem, career awareness, parental education, parental occupation, parental expectations, educational expectations, teacher expectations, and creative opportunities?

Limitations of the Study

There were several limitations to the study. First of all, while the Educational Quality Assessment Inventory provides high standards for reliability and validity, it was designed to measure the quality of education provided by the public schools of Pennsylvania. Although some of the variables included on the EQA seemed appropriate to the study, based on self-efficacy theory, those variables were identified ex post facto to the administration of the inventory. It is possible that other variables might have been considered and found to contribute to self-efficacy expectations. Nonetheless, even though the instrument was not designed for the purpose for which it was used in the study, it seemed to be the most conducive to supplying reliable and valid data.

A second limitation of the study was in the measurement of the dependent variable: self-efficacy expectations. Since a standardized instrument for measuring self-efficacy expectations was nonexistent, a proxy measure extracted from a standardized instrument seemed to be a better alternative than the development of a questionnaire which might prove less reliable and less valid. While the measurement of self-efficacy expectations using the differential between occupational desires and occupational expectations proved to be a valid comparison

according to the theory, it should be noted that this was a proxy measurement of self-efficacy expectations rather than an actual measurement.

A third limitation was that the study examined only 11th grade students. An attempt was made to include grades 5 and 8 because the EQA was administered at all three grade levels and because it would have been of interest to see developmental differences in order to encourage intervention strategies to increase and strengthen levels of self-efficacy. Unfortunately, the EQA instruments for grades 5 and 8 did not include reportings for occupational desire and occupational expectations because it was felt that the younger students' responses to those items would not be valid. Therefore, only the 11th grade administration could be used for the purposes of the study in measuring differences in self-efficacy expectations in regard to vocational aspirations.

Another limitation was that the data were collected from subjects at one point in time, that being the 1981 administration of the EQA to 11th grade students. While the self-efficacy expectations measured through the study provided valuable information collected from the data analyses, it is possible that those expectations may change over time and as the subjects engage in more experiences. Even though this was a limitation, it was felt that the analysis provided a starting point from which to embark upon the consideration of self-efficacy expectations in relation to occupational choice and career development.

A fifth limitation was that, because of the extremely large sample size, tests of significance should be interpreted with caution.

With over 30,000 subjects involved in the study, it was not too difficult to achieve significance. Perhaps a smaller sample would have yielded less significant results. However, with the sample size analyzed in the study, differences in self-efficacy expectations were ascertained.

A final limitation was that the data analyses by categories of major groups as well as subgroups was dependent upon the accuracy of the self-reporting by students completing the EQA Inventory. Even though monitors were available to assist students, it is possible that inaccurate reportings may have occurred.

Even with these limitations, the study provided interesting conclusions about differences in self-efficacy expectations in relation to career development based on the Pennsylvania Educational Quality Assessment Inventory. Chapters IV and V summarize those conclusions as well as suggest recommendations for future research.

Summary

The educational community has become increasingly concerned with women and their patterns of career development. Vocational education, in particular, has initiated a concerted effort to attract women into careers offered through vocational training. However, without understanding of the psychological motivations underlying career choice, progress toward the development of intervention strategies to foster optimum career development will be inadequate. This research examines environmental factors such as rural, urban, and suburban environments

and family situations such as traditional, dual career, and single parent.

Because the EQA is a state-wide assessment of education administered through the Pennsylvania Department of Education, its contribution to education in Pennsylvania is significant. Through this research, an instrument has been developed by which each school district could assess individual levels of perceived self-efficacy. Based upon this analysis, schools in Pennsylvania could formulate and offer intervention strategies to increase and strengthen self-efficacy expectations and to encourage women to achieve their highest vocational potential--one option of which might be vocational education.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Career development inquiries must necessarily be concerned with an understanding of vocational behavior. One distinction to be considered is that of content and process. Content deals with the "what's" involved in career development, including the array of career options available to the student. Typically, content issues deal with such facets of career development as self-assessment, career exploration, reality testing, and job search strategies. These are the mechanical processes by which vocational counselors typically direct a student through the various stages of career development, culminating with career decision making, goal setting, preparation, and entry into the chosen career field. It appears that the thrust of the general application of career development theories in working with students is on the content aspects. Such an emphasis, while valid and absolutely necessary, limits the scope and effect of counseling to the immediate and short-term concerns of the student.

A more pervasive notion in career development is that of process, or the "why's" of career development. Process-oriented counselors look beyond the face values of behaviors and responses. They attempt to analyze underlying attitudes and beliefs in terms of the preferences and values expressed by students. Such an approach implies a

psychological-sociological perspective in career counseling. Counselors must be sensitive to the impact of innumerable factors in the shaping and development of an individuals' perceptions both of themselves and of their environments. Because individual perceptions may or may not be accurate, the counselor must act as both a filter and change agent to adjust perceptual inaccuracies and to provide maximization of student potential in terms of career aspirations. Social learning theory, when applied to career development, is a potent conceptual framework from which to draw both inferences and techniques for understanding psychological-sociological phenomena and for facilitating student progress toward a better understanding of self and environment within the context of vocational behavior.

The Stanford University Cubberly Conference in 1965 was one of the first major attempts to advance the principles of social learning theory. According to Hosford (1980b), this represented "a major departure from how counselors had conceptualized the counseling process" (p. 467). In 1975, Krumboltz, in his Presidential Address to the Division of Counseling Psychology at the APA Convention in Chicago, presented a social learning theory analysis of career decision making and postulated a series of testable hypotheses thus substantiating the applicability of social learning theory to career development.

Albert Bandura's social learning theory of self-efficacy was introduced in 1977. Drawing from expectancy-valence theory (Vroom, 1964; Lawler and Suttle, 1973; Raynor and Entin, 1982), which has been researched extensively, Bandura's self-efficacy theory provides a more

situation-specific application for understanding a wide assortment of behaviors. Because it is a relatively new theory, the literature dealing with self-efficacy is rather limited. It has not been until very recently that the theory has attracted the attention of researchers and scholars in the field. The purpose of this review is to provide a definition of the concept of self-efficacy and to relate its applicability to the study of the vocational behavior of women.

Social Learning Theory

Reciprocal Determinism

B. F. Skinner (1971) has claimed that behavior is controlled by environmental contingencies, e.g., "A person does not act upon the world, the world acts upon him" (p. 211). Bandura (1977b) argues that while behavior may be regulated by such contingencies, individuals partially make their own contingencies. Instead of emphasizing either environmental determinism or personal determinism, social learning theory conceives of reciprocal determinism for the emergence of the image of people's efficacy.

As early as the nineteenth century, suggestions were made that the surroundings act upon the organism, and at the same time, the surroundings are acted upon by it. The relationship is one of reciprocity and is a manipulation of the influence of the whole. Phillips (1976) adhered to the "principle of internal relations" whereby "entities are necessarily altered by the relations into which they enter" (p. 8).

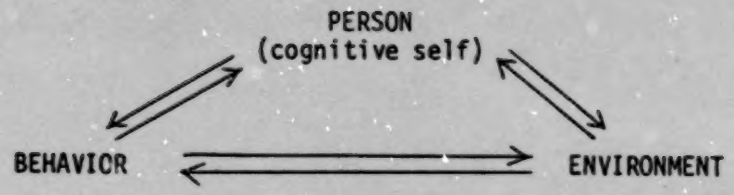
An example of reciprocal determinism is presented by Dewey and Bentley (1946) in considering the behavior of a person who wants to borrow money:

> Borrower cannot borrow without lender to lend, nor can lender lend without borrower to borrow, the loan being a transaction that is identifiable only in the wider transaction of the full legal-commercial system in which it is present as event. (p. 547)

It is assumed by social learning theorists that individuals operate within a conceptual system. Everything they perceive, do, or say is determined by these conceptual systems (Harvey, 1970). How individuals perceive themselves, then, will affect how they will behave in certain situations. However, feedback received from the outcomes of their responses will affect perceptions of self and modifications of immediate environments will have a reciprocal effect on the types of behavior exhibited (Hosford and Barmann, 1980).

Bandura (1978a) felt that "because personal and environmental determinants affect each other in a reciprocal fashion, attempts to assign causal priority to these two sources of influences reduce to the 'chicken-or-egg' debate" (p. 345). Phillips and Orton (1983) viewed reciprocal determinism as interdependent relationships between (1) environmental factors, (2) behavior, and (3) cognitive factors.

Bandura (1978a) conceptualized personal and environmental determinants in reciprocity according to the following schemata (p. 348):



He asserts that to understand the process of reciprocal interaction, one must analyze how each is conditional on the other. He cautions, however (Bandura, 1983), that numerous other influences including social, institutional and physical also contribute to the shape directions take. Bandura (1981b) contended that through their actions, individuals contribute to the nature of their situations and are at least partial creators of their own history.

Effort and Performance

Atkinson (1957) espoused a theory of achievement motivation by which tasks can be ordered according to their difficulty or the probability of being successful at them. Attributional theories postulated that individuals use information to arrive at causal ascriptions for achievement outcomes in terms of ability, effort, task difficulty and luck (Weiner, Heckhausen, Meyer and Cook, 1972). It has been found that individuals are not likely to engage in a given course of behavior if they do not expect it to lead to desired outcomes. In addition, individuals will have differing values for any particular outcome (Porras, Hargis, Patterson, Maxfield, Roberts, and Bres, 1982). Bandura (1978b) found that "people give up trying when they lack a sense of personal efficacy and no longer expect their efforts to produce any

beneficial results in an environment that is unresponsive or is consistently punishing" (p. 19).

Furthermore, it was found that even though an individual may believe that a specific behavior will lead to a desired goal, he or she may judge her or himself incapable of expecting the necessary performance (Porras et al.). According to Kahneman (1973) "voluntary control of effort is limited in scope" (p. 27), whereas it is assumed that the subject has a choice of effort levels and the ability to choose the optional level. Rotter, Chance and Phares (1972) felt that aspirations differ from judgements of what one can do in the here and now. Many factors other than ability can affect performances, such as the difficulty of the task, effort expended, amount of external aid received, situational circumstances under which the performance occurs, and temporal patterns of successes and failures (Bandura, 1981b).

Thomas (1983) considered a set of assumptions about the antecedents and consequences of effort expenditure where a subject is engaged in achievement-oriented activity. Effort expenditure in the theory of achievement motivation was found to be a decreasing function of task difficulty and an increasing function of efficacy. The theoretical significance of the results depends upon (a) whether the subject is free to choose the level of effort and the task to perform, (b) what the consequences of effort expenditure are, and (c) what goal the subject is trying to achieve. In social learning theory, the reference is made to cognitive structures that provide the referential standards against which behavior is judged and a set of subfunctions for the perception, evaluation, and regulation of action (Bandura, 1978b).

The Concept of Self-Efficacy

Self-efficacy is a relatively new concept in social learning theory. Bandura (1977a) contended that behavior and behavior changes are mediated by expectations of self-efficacy which are expectations or beliefs that one can perform a given behavior. The theory stated that the level and strength of self-efficacy will determine (1) whether or not a coping behavior will be initiated, (2) how much expenditure of effort will result, and (3) how long the effort will be sustained in the face of obstacles. The model proposed four principal sources from which expectations of self-efficacy are derived: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal.

Performance Accomplishment

Performance accomplishment is based on personal mastery experiences. Successful performance tends to increase expectations of self-efficacy. Adequate assessment of past accomplishments and facilitation of opportunities for women clients to succeed in various behavioral tasks necessary for positive career development may result in increases in measured ability as well as perceived self-efficacy (Hackett and Betz, 1981).

Vicarious Experience

Expectations are derived from seeing others perform. An important consideration is exposure to successful and credible role models. While many women have been limited in their exposure to such role

models, the process of career counseling should include modeling as a predominant technique. It is important that the modeled behaviors convey clear outcomes as well as represent diversity in personal characteristics of the models to confirm to the client that success is attainable by a variety of individuals with different capabilities and backgrounds (Bandura, 1977a).

Verbal Persuasion

Verbal persuasion provides information derived from the verbal suggestions of others. People who are socially persuaded that they possess the capabilities to master difficult situations are likely to raise expectations of personal competence (Bandura, 1977a). Since there is some evidence that women are encouraged less as a result of dichotomous socialization processes, encouragement or discouragement, past verbal persuasion should be assessed in order to provide a basis for understanding vocational behavior and for designing strategies to either enhance or negate client conceptions of potential for success.

Emotional Arousal

Emotional arousal usually results from stressful and taxing situations. Research has shown that women score higher on anxiety measures than do men and "thus may be more likely to experience physiological responses which decrease their perceptions of self-efficacy" (Hackett and Betz, 1981). Sex biased attitudes and perceptions toward vocational behavior may result in internal conflict which produces anxiety and stress in women. Attempts to alleviate anxiety and to

cognitively restructure attitudes and perceptions are important considerations in the counseling process.

Bandura (1977a) distinguished between an outcome expectancy and an efficacy expectation. An outcome expectancy is defined as a person's estimate that a given behavior will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce outcomes. Efficacy expectations vary on several dimensions: magnitude, generality, and strength.

While levels of self-efficacy appear to be increased and strengthened as a result of various treatment modes, Bandura (1977a) offered several cautions in the application of the theory to specific situations. First of all, people cognitively process efficacy information differently. Depending on how people judge the many factors bearing on their performance, there will be some degree of variation in their perceptions of self-efficacy. Secondly, people have many different types and amounts of efficacy-relevant experiences. Providing one new source of efficacy information will not necessarily affect the overall level of self-efficacy. Nevertheless, the theory does have significant implications for the exploration of vocational behavior in women as well as men. By understanding the concept of self-efficacy, the sources from which it is derived, and the impact it has on vocational behavior, psychological procedures can be identified as possible intervention strategies to increase levels of self-efficacy and to aid individuals in attaining their highest potential.

Research on Self-Efficacy Theory

To date, a limited amount of research has dealt with the theory of self-efficacy. This section provides a review of the research that has been conducted.

Empirical tests of this theory confirmed that different treatment approaches alter expectations of personal efficacy, and the more dependable the source of efficacy information, the greater the changes in self-efficacy (Bandura, Adams, and Beyer, 1977).

Adult phobics were given different treatments based on performance mastery, vicarious experience, or no treatment. As predicted, the treatment which involved performance mastery produced higher, stronger, and more generalized expectations of personal efficacy than did the treatment relying on vicarious experience. Two subsequent experiments (Bandura and Adams, 1977) tested other dimensions of self-efficacy, again using adult phobics. The first study investigated the hypothesis that personal efficacy expectations could be strengthened to effect changes in avoidance behavior by systematic desensitization. The results support the hypothesis by finding self-efficacy to be a highly accurate predictor of desensitization. The second experiment used participant modeling during the course of treatment to investigate the process of efficacy and behavioral change. Efficacy expectations formed through partial mastery experiences during the course of treatment predicted at an 84% level of accuracy performance on highly threatening tasks that subjects had never done before. In a more recent experiment (Bandura and Schunk, 1981), proximal goal setting was tested as a mechanism for cultivating competencies, self-perceptions

of efficacy and intrinsic interest in children who exhibited gross deficits and disinterest in mathematical tasks. While distant goals had no effects, proximal sub-goals resulted in the children's substantial mastery of mathematics, development of a sense of a personal efficacy, and intrinsic interest in mathematical activities.

Schunk (1981) studied achievement strivings in a given subject matter in relation to efficacy expectations. He hypothesized that "children who have a strong sense of efficacy in a given subject matter would be expected to exhibit strong achievement strivings." However, "children who perceive themselves as inefficacious should tend to shun achievement tasks or to engage in them halfheartedly and to give up readily in the face of obstacles" (pp. 93-94). He found that an accurate predictor of arithmetic performance was perceived self-efficacy.

Anderson and Jennings (1980) examined the effects of attribution of failure to their efforts (a controllable factor) or abilities (an uncontrollable factor). Findings suggested that subjects who attrib[illegible] failure to efforts were more willing to modify the effort necessary to achieve success whereas subjects who attributed failure to ability were more likely to conclude that they could not succeed. They concluded that the two different mind sets may account for differences in self-efficacy expectations. In similar studies (Stolte, 1983; Rotter, Seeman, and Liverant, 1962), it was concluded that a generalized sense of self-efficacy was equated with locus of control.

Level of aspiration is concerned with the goals people set for themselves. Aspirations deal with judgements of what one can do now.

On the other hand, outcome expectations are subjective estimates of whether or not a given behavior will lead to certain outcomes. Rotter, Chance, and Phares (1972) contended that "self-percepts of efficacy are concerned with judgements of one's capability to produce a given pattern of behavior" (p. 93). Schunk and Gan (1981) felt that an important goal property is proximity whereby goals that can be achieved rapidly result in greater motivation toward achievement than goals that project more into the future. According to Bandura (1981a), proximal goals can also enhance percepts of efficacy and that knowledge of progress facilitates development of perceived self-efficacy. Schunk (1983) substantiated this motive in a study which yielded results of a significant main effect on perceived efficacy due to proximal goal setting.

In other studies, Hyman and Rolf (1983) found that social reinforcement increased motivation, work interest, and simulated work activity production. Modeling treatments were found by Zimmerman and Ringle (1981) to significantly affect self-efficacy estimates. Valerio and Stone (1982) concluded that assertive behavior versus non-assertive behavior significantly increased self-efficacy. In a study involved with individual differences (Pentz, 1981), results suggested that subjects with "low anxiety and high verbal reasoning produced higher levels of self-efficacy and assertive behavior" (p. 531).

While the research is far from conclusive, it appears that these studies could provide substantial support for self-efficacy theory in general. More specifically, the findings appear to be adaptable to the concept of career development because they show differences in

self-efficacy expectations as a result of where one lives (rural, suburban, or urban setting) and the occupational status of the parents (traditional, dual career, or single parent). In addition, they suggest methods by which optimal vocational behavior can be enhanced and promoted.

Need to Study the Vocational Development of Women

While acknowledgement of the increased participation of women in the work force is widespread and identification of women as a special subgroup with which career counseling should be concerned has gained increasing support, differential career development approaches for women have been generally lacking.

As early as 1957, Super attempted to classify the patterns of careers for women but did not propose any differential counseling of women as a result of different needs. Holland (1962) admitted that his theory on personality types was limited in its applicability to women and that the theory "must be revised to account more adequately for the vocational development of women, whose development and vocational tasks and goals differ significantly enough from those of men to require some different formulations" (Osipow, 1968, p. 59).

Ginzberg, Ginsburg, Axelrad, and Herma (1951) found differential factors between males and females in career planning which included focus on marriage, vocational uncertainty of women, and naiveté about careers and future plans. Osipow (1975) postulated two assumptions upon which career theories are based: (1) individuals have available numerous career choices and (2) individuals are motivated to satisfy

their interests through these choices. In applying the assumptions to such special groups as women, Osipow suggested that these assumptions are not met. Therefore, applicability of the theory is limited and need for differential approaches is intensified.

From an historical perspective, Matthews (1974) provides a review of the changing roles of women since the 1950's as well as the vocational development of girls from infancy through adulthood. Emphasizing the special needs of women, Herr and Cramer (1979) cited research which supports several informative findings. While the research is pertinent to women in higher education, it is felt that the results can be generalized, for the most part, to all women. Their points which pertain to this discussion are:

> 1. There is a need for continual evaluation and updating in relation to the career needs, aspirations, and life plans of women.
>
> 2. There is considerable documentation that counselors, both male and female, are consciously or unconsciously sexist and possess inaccurate information about women and work.
>
> 3. Many of the standard "tools of the trade," especially tests, may set up artificial sex barriers.
>
> 4. Studies related to what distinguishes "career oriented" women from "noncareer oriented" women or what distinguishes women who enter innovative or pioneering rather than traditional careers offer few guidelines for practice.
>
> 5. There is presently no clear theory relating to the career development and career choice of women.
>
> 6. There is a lack of applied research in the area of counseling women. (pp. 217-218)

Psathas (1978) described a number of factors which appear to operate in special ways for women, because "most work in the problem of occupational choice has been confined to men and little attention has been directed to the different factors which operate for women by virtue of the definition of their sex role in society" (p. 257). These factors include (1) marriage, intention, fulfillment, (2) family finances, (3) social class, (4) education and occupation of parents, and (5) social mobility and mate selection. Of special importance, according to Safilios-Rothschild (1979), is the role conflict between marriage and career.

Farmer (1976) suggested that motivation differs from that of men as a result of (1) reduction in academic self-confidence, (2) fear of success, (3) vicarious achievement motivation, (4) home-career conflict, (5) myths about women and the world of work, (6) lower risk taking in females, and (7) sex role orientation.

Fitzgerald and Crites (1980) provided reinforcement for the need for differential career development approaches for women and offer counseling techniques which distinguish between the career choice content and the process of career choice. They concluded that "competent counseling with women necessitates not only the thorough training in traditional career development that counseling psychologists presently receive but requires, in addition, comprehensive knowledge of a specialized nature in the new career psychology of women" (p. 59).

Application of the Theory to Women

It appears that little girls are encouraged to foster dependency. Thus, they engage in less independent exploration of their environment. As a result, girls generally do not develop coping skills to deal with the environment and thus have little confidence in their abilities to do so. "Boys learn effectiveness through mastery, but girls are effective through eliciting the help and protection of others" (Medrick, Tangri, and Hoffman, 1975). As a result, women and girls are either not encouraged or are discouraged from seeking activities which would strengthen expectancies for self-efficacy (Maccoby and Jacklin, 1974). Research has also shown that women do experience motives to achieve but that their motives are directed toward traditional female roles, i.e., the home and family (Stein and Bailey, 1973). Sex role descriptions indicate that "passive-dependency is to be expected of the female role and that achievement and independence in problem solving is to be expected of the male role" (Sherman, 1976).

Thus it would seem logical that women would strive to achieve in the areas of interpersonal relationships, interpersonal skills, and interpersonal communication instead of pursuing careers. However, in another study that asked women what types of things in their lives they would consider as accomplishments or achievements, the answers were interpersonal relationships as well as career or school achievements (Frieze, Parsons, Johnson, Ruble and Zillman, 1978).

Stake (1979) contended that women with little confidence in their abilities may avoid career involvement. In a study utilizing Performance-Self-Esteem Scales, it was found that PSES scores were

related to the extent of career commitment and women's role perceptions. Low levels of self-efficacy may be a contributing factor to the avoidance of career involvement.

Self-efficacy theory, therefore, could be quite applicable in understanding the vocational expectations and behaviors of women and the planning of self-efficacy enhancing activities in the career development process.

Krumboltz, Mitchell, and Jones (1976) already have advocated using a social learning theory model in career counseling. They identified two categories of learning, instrumental learning experiences and associative learning experiences, as types of past experiences which have an impact on career development maturity. Krumboltz and Rude (1981) further identified the outcomes of such learning experiences as (1) self-observational generalizations about task efficacy, (2) self-observational generalizations about interests, (3) self-observational generalizations about personal values, (4) world-view observations, and (5) task approach skills. Self-efficacy expectations, according to the theory, seem to be an integral factor contributing to the identified outcomes of learning experiences.

As well as suggesting a self-efficacy approach as being particularly relevant to the understanding of the career development of women, Betz and Hackett (1981) have empirically supported the applicability of Bandura's self-efficacy theory in relation to career decision-making. They investigated the importance of self-efficacy in understanding the internal and external barriers to women's career development. The results of their study indicated "significant and consistent sex

differences in self-efficacy with regard to traditional and non-traditional occupations" (p. 399). As a result of the findings, they propose that access and exposure to the four primary sources of information pertinent to the development of efficacy expectations (performance accomplishments, vicarious learning, verbal persuasion, and emotional arousal) support the concept of self-efficacy as a basis for a career counseling model for women. They postulate that "largely as a result of socialization experiences, women lack strong expectations of personal efficacy in relationship to many career-related behaviors and, thus, fail to fully realize their capabilities and talents in career pursuits" (p. 327). Self-efficacy theory in relation to the career counseling of women may provide the insight needed to develop a more effective approach to understanding vocational behaviors and expectations.

Family Determinants

Contemporary social learning theorists recognize that an individual's own personality affects the nature of the socializing behaviors of others and that there may be individual differences in youngster's susceptibility to peer and family influences (Brook and Whiteman, 1983). Bandura and Schunk (1981) found that judgements of self-efficacy are not mere reflections of past performance. Capability influences derived from one's performance vary depending on the weight placed on personal and situational factors that affect how one performs.

Research on familial antecedents of adolescent development has been focused on socialization and modeling practices (Jersild, Brook, and Brook, 1978). Conceptually, the socialization dimensions can be viewed as consisting of childrearing practices and conscious identification of the child with his or her parents (Schaefer, 1965).

Stolte (1978) showed that the feedback a person obtains as a result of social-situational interactions affects self-efficacy perceptions. For years, EQA data have consistently shown differences between rural, suburban and urban schools in terms of performance on both performance goals and condition variables (Kohr, 1982). Thus it seems appropriate to examine not only differences in self-efficacy expectations based upon familial situations (in this study traditional, dual career and single parent) but also upon environmental situations (rural, suburban and urban).

Occupational Preferences

According to Krumboltz (1976) "the social learning theory of career selections was designated as a first step toward understanding more precisely what specific kinds of learning experiences contribute to the development of occupational preferences." It posited certain environmental and cultural events that facilitate or inhibit the reinforcing and

> punishing consequences which contribute to various occupational preferences. It was designed to make more explicit how certain skills in decision making and other task approach skills are developed as a result of the interaction of genetic endowment and learning experiences in a cultural context. It was also designed to explain

> how specific occupational entry behaviors result from the interaction of skills and preferences generated in the past with current cultural, social and economic forces. (p. 17)

A significant determinant is identity formation. Dowd (1981) provided a concept of the ramifications of occupational preference in relation to identity formulation:

> If identity is narrowly defined, it thereby becomes more certain, but one risks the exclusion of potentially fruitful concepts and perhaps renders oneself incapable of future modifications as conditions change. On the other hand, if identity is broad and diffuse, encompassing a wide variety of concepts, one is able to incorporate widely divergent ideas and directions, but one is less certain of who one is. (p. 81)

In the former situation, individuals are concerned with finding appropriate occupations while in the latter, individuals are concerned with maximizing their developmental potential in all areas of their lives.

Relating to self-efficacy perceptions, Wheeler (1983) contended that "self-efficacy models have stressed personal perceptions of individual capacities to perform in different occupations to occupational preferences" (p. 73). He went on to describe occupational preferences as a function of the personal perceptions of the capability of performing an occupation. The major determinant of interest in entering these occupations is personal expectations of self-efficacy.

It has already been noted that there are differences in occupational choice between females and males. Utairat (1980) found significant differences between male and female students in grades 5, 8, and 11 in both self-concept and vocational maturity. Occupational preference has been linked with female anxiety in the area of math/science

perception of ability. Tobias and Weissbrod (1980) contended that "there is a link between mathematical skills and the cultural, educational, and occupational barriers experienced by women, and more important, the discovery that persistence rather than ability could account for male-female differences in mathematical performance" (p. 63). Betz and Hackett (1981) utilized both ACT Math and English scores to investigate the importance of self-efficacy expectations in the explanation of women's continued underrepresentation in many professional and managerial occupations. They found that females reported significantly higher levels of self-efficacy with regard to traditional occupations and significantly lower levels of self-efficacy with regard to non-traditional occupations.

Wheeler's study (1983) compared the self-efficacy and expectancy models of occupational preferences for college males and females. The findings supported the contention that the perception of self-efficacy may be an important factor in explaining sex differences in occupational preferences.

Finally, application of self-efficacy to the understanding and treatment of career indecision was attempted by Taylor and Betz (1983). They suggested that the concept of career-related self-efficacy expectation provides a useful framework for the understanding, assessment, and treatment of vocational indecision.

Conclusion

Growing evidence suggests that cognitively oriented theories can explain behavior in terms of central processing of direct, vicarious

and symbolic sources of information (Bandura, 1977b). Greenwald (1980) argued that cognitive biases such as egocentricity (self as the focus of knowledge), "beneffectance" (perception of responsibility for desired, but not undesired outcomes), and cognitive conservatism (resistance to cognitive change) function to preserve organization and structure in the environment. Experiences are systematically coded and retained in memory for future use. Baum (1973) has found that behavior is related to outcomes at the level of aggregate rather than immediate consequences.

Aggregate consequences of social learning experiences are salient characteristics of social learning theory. While the application of the theory may have universal implications for career development in general, it has explicit implications for the career development of women. Empirical research has shown that the socialization process of women differs from that of men. By attending to the aggregate consequences of differential socialization and learning experiences, the vocational counselor should be better able to understand the stated or underlying perceptions of female students in relation to vocational behavior and, therefore, may provide more effective content orientation as a result of having also dealt with the process of career development.

Cognitive social learning theory is a viable concept in understanding the process function of vocational counseling. Its application to career counseling theory in general, and to the career counseling of women specifically, provides a framework of reference for the counseling profession. The relevance of the self-efficacy theory may prove to be a valuable basis for providing differential counseling for women.

Identification of the sources of information from which expectations of self-efficacy are derived should generate many testable hypotheses and may have numerous implications for the formulation of counseling intervention strategies.

In conclusion, Blocher and Siegal (1981) suggested that the field of career development must

> deal with cognitive processes involving both structure and content. It must focus on the overall interaction between the individual and the environment, not merely on the reinforcement contingencies in the environment. It must also provide hypotheses and explanations that are relevant to the lives of the full range of people in our pluralistic society. (p. 42)

It was with this intent that this investigation herein was conducted.

CHAPTER III

PROCEDURES

General Design

The intent of the study was to determine if there were differences in self-efficacy expectations in relation to career development among women from rural, suburban, and urban environments. Furthermore, the investigation sought to determine if family situation contributed to differences in self-efficacy expectations. Those three situations were (1) traditional (the father works outside the home, the mother in the home), (2) dual career (both mother and father work outside the home), and (3) single parent (only one parent present within the family unit). While the primary interest was with self-efficacy expectations of women, it was felt that a comparison with men in each of the investigative categories would be important in drawing conclusions from the research.

EQA Data

The data base used for the study was taken from the 1981 administration of the Educational Quality Assessment Inventory of eleventh grade students. The Educational Quality Assessment Program (EQA) was the result of a 1963 legislatively mandated program which required the Pennsylvania State Board of Education to develop an evaluation procedure to objectively measure the adequacy and efficiency of educational

programs within the Commonwealth (Hertzog and Seiverling, 1982). The questionnaire was designed to incorporate Pennsylvania's Twelve Goals of Quality Education adopted by the State Board of Education. Both cognitive and non-cognitive performance areas were assessed. Cognitive areas included communication skills in both reading comprehension and writing, mathematics, knowledge of law and government, health knowledge, career awareness, knowledge of human accomplishments and information usage. Non-cognitive areas assessed were self-esteem, understanding others, interest in school and learning, societal responsibility, health and safety practices, creative activities and appreciating human accomplishments.

In order to take into account the vastly differing resources available to the various school districts within the state as well as differences in teaching staffs and financial and parental support, 35 condition variables were collected through the EQA Inventory (see Figure 1). Information about the measurement, weighting and index description of these condition variables are found in Appendix H (in pocket) while Figure 1 depicts the 35 variables by EQA coding and definition.

Because of the large sample (33% of Pennsylvania students enrolled in public schools) and because of the expertise of the EQA personnel in designing the questionnaire, the inventory has been proven to be highly reliable and valid. Internal consistency was determined by estimating the average reliability of each item and then inserting this value in the Spearman and Brown formula to obtain the reliability of scores. Of the 42 reliabilities, 21 were in the .90's, 19 were in

GRENROLL (Grade enrollment)

PCTTILI (Percentage of Title I low income students)

TUITION (Tuition rate)

TLOCALE (Teacher locale)

TSATPAR (Teacher satisfaction with relationships with parents)

TEDUC (Teacher education)

TEXPER (Teacher experience)

CLSIZE (Class size)

READTIME (Teacher estimation of reading instruction time)

MATHTIME (Teacher estimation of mathematics instruction time)

EXTRACT (Activities external to the classroom)

TRELATE (Teacher/Student/Parent relationships)

DISRUPT (Factors disruptive to classroom management)

INFLUENCE (Teacher influence upon instructional decisions)

TSTAFF (Staff interpersonal relationships)

DISCPROB (Discipline problems)

PAREDUC (Parental education)

PAROCC (Parental occupation)

OCDESIRE (Occupational desire)

OCEXPECT (Occupational expectation)

PCTGIRLS (Percent girls)

RESIDE (Type of community)

Figure 1. EQA Condition Variables

PCTWHITE (Percent white students)

LIBRARY (Accessibility of library)

STABLE (Stability of student residence)

FAMSIZE (Family size)

FAMORDER (Family order)

SPARINT (Student perception of parental interest in school)

HOMEWORK (Amount of homework)

TVWATCH (Student time spent watching television)

PAREXP (Student perception of parental expectations)

EDEXPECT (Student educational expectations)

STEACHEX (Student perception of teacher expectations)

HOMEREAD (Reading material in the home)

HOMECLIM (Home climate)

Figure 1 (Continued)

the .80's and only 2 in the .70's. Thirty-four reliabilities were in excess of .85 (Kohr, Hertzog, and Seiverling, 1982). Validity studies were conducted by review committees and through student interviews.

The data collected by the EQA Inventory proved applicable to the design of this study. Selection of subjects from the three environmental situations--rural, suburban, and urban--was possible through the RESIDE variable. Selection of subjects from the three family situations--traditional, dual career, and single parent--was possible through the PAROCC (parental occupation) variable.

Drawing upon self-efficacy theory, two performance goals and seven condition variables were identified as possible contributors to self-efficacy expectations. These were self-esteem, career awareness, parental education, parental occupation, occupation desired, occupation expected, parental expectations, education expected, and teacher expectations. The variables were selected from Bandura's theory (1977a) which contended that there are four sources of personal information which contribute to self-efficacy expectations--performance accomplishment, vicarious experience, verbal reinforcement, and emotional arousal. Self-esteem (personal judgement of worthiness) and career awareness (the acquisition of knowledge about different kinds of work and the formation of attitudes to enhance one's chances of succeeding) seemed to be appropriate contributors to performance accomplishments as a source of self-efficacy. Vicarious experience seemed to be measured by the parents' education and their occupations. Verbal reinforcement was evidenced by both parental and teacher expectations. The measure to determine emotional arousal appeared

to be a comparison between the occupation desired, the occupation expected, and the education expected.

To determine a proxy measure of self-efficacy expectations in relation to career development, it was concluded that two of the variables used in the study would be appropriate. If self-efficacy is defined as the belief that one can attain certain levels of vocational behavior and that they can envision themselves acquiring the necessary education to reach those vocational goals, a proxy measure of perceived self-efficacy seemed to be a comparison between occupational desire and occupational expectation. Both OCDESIRE and OCEXPECT were measured using a list of 148 occupations from which students reported the occupations most like those they first wished to follow when finished in school and then those occupations most like those they expected to follow when finished with school. The occupational categories were weighted from 1 to 99 according to a combination of education needed to secure the occupation and income derived from the occupation. A higher value indicated that students desired to attain higher paying jobs requiring a higher educational level (OCDESIRE) and expected to attain higher paying jobs requiring a higher educational level (OCEXPECT). No discrepancy between the two values would indicate that students expected to attain the desired occupational level--thus that they were self-efficacious. Any discrepancies between the two values would indicate either positive or negative differentials. These values then were used as a proxy measure of the dependent variable of self-efficacy expectations for a comparison among categories of subjects.

Description of Variables

The independent variables used in the study were (1) environmental situation (rural, suburban, or urban) and (2) family situations (traditional, dual career, or single parent). Rural was defined as living in a small town (less than 10,000 people), in the open country or in a farming community. Suburban was defined as living in a suburb of Philadelphia or Pittsburgh, of a large city, or of a medium size city. Urban was defined as living inside a large or medium size city.

As for family situation as noted previously, traditional was defined as the father working outside the home, the mother working inside the home; dual career as both parents working outside the home; and single parent as only one parent present within the family unit.

Further analysis of each factor was done by comparing levels of self-efficacy expectations in the career development of subjects by subgroups as defined in Figure 2.

The dependent variable was the measurement of the levels of self-efficacy expectations in regard to the career development of each of the groups in the investigation. The proxy measure used for the dependent variable was the discrepancy value between occupational desire (OCDESIRE) and occupational expectation (OCEXPECT).

Population and Sample

The Educational Quality Assessment Inventory provided a normative sample each year of the students' involvement in education in the 5th, 8th, and 11th grades in the Commonwealth of Pennsylvania. The investigation herein dealt exclusively with the sample drawn from 11th grade

Rural Population Sample

Farm vs. Non-farm

Males vs. Females

Suburban Population Sample

Mother professional vs. Mother non-professional

Men vs. Women

Urban Population Sample

Black vs. White vs. Other

Men vs. Women

Traditional Population Sample and Dual Career Population Sample

Father professional--Mother non-professional vs.

Father non-professional--Mother non-professional vs.

Father professional--Mother professional vs.

Father non-professional--Mother professional

Men vs. Women

Single Parent Population Sample

Father professional vs.

Father non-professional vs.

Mother professional vs.

Mother non-professional

Men vs. Women

Figure 2. Subgroups Used for Comparisons of Self-Efficacy Expectations

students. It was estimated by the Department of Education that there are approximately 150,000 11th grade students in public educational institutions in the state of Pennsylvania and that 70,000 to 75,000 of those are female. The data base for the 1981 EQA Inventory provided a total sampling of 37,942. Because of the extensive data base provided by the EQA, all subjects included in the sample were subjects for analysis. This constituted a 33% state sample which contained at least three districts from each intermediate unit in the Commonwealth.

Subjects were selected and categorized based on several condition variables included in the EQA Inventory. The following EQA descriptions were used to obtain samples of subjects for each of the independent variables (Hertzog and Seiverling, 1982).

Environmental Situation

The RESIDE variable indicated the type of community in which the students were living. With the aid of a monitor, students reported on a scale of 0 to 7 whether they lived in (0) the open country or in a farming community, (1) a small town of less than 10,000 people, (2) a suburb of a medium size city, (3) a suburb of a large city, (4) a suburb of Philadelphia or Pittsburgh, (5) a medium size city of 10,000 to 100,000 people, (6) a large city of 100,000 to 500,000 people, or (7) Philadelphia or Pittsburgh. Respondents indicating 0 or 1 were considered rural; 2, 3, or 4 were considered suburban; and 5, 6, or 7 were considered urban.

Family Situations

The PAROCC variable indicated parental occupation. The students reported the occupation most like their father's or male guardian and most like their mother's or female guardian from a list of 148 possible occupations and 6 special categories. The occupations were numerically coded from 001 to 148. The six special categories were (200) housewife, (300) unemployed, (400) pensioned, (500) student, (600) not living at home, and (700) deceased. In addition, the occupational categories were weighted from 1 to 99 according to a combination of education needed to secure the occupation and income derived from the occupation.

Respondents indicating father's occupation as 001 to 148 and mother's occupation from 200 to 500 were considered traditional; those indicating both parents' occupations from 001 to 148 were considered dual career; and those indicating one parent's occupation as 001 to 500 and the other parent 600 to 700 (not living at home or deceased) were considered single parent.

Subgroup Sample

The identification of subgroups within each of the independent variables was accomplished through the PAROCC (parental occupation), PAREDUC (parental education), and RESIDE (type of community) variables included on the inventory as well as biographical data collected from each respondent. Each group was factored into areas or subgroups based on possible influential determinants of self-efficacy expectations. Of special interest was the delineation between parental

engagement in occupations or education of a professional versus non-professional nature.

Professional parental occupation was considered to be an occupation which required a college degree. To that end, all 148 occupations were compared with the Occupational Outlook Handbook (U.S. Department of Labor, 1982) to determine those which necessitated or recommended a college degree for entry into that occupation. The PAROCC variable was thus arbitrarily factored into professional versus non-professional occupations.

The PAREDUC (parental education) variable was also factored in the same manner. On this condition variable students reported the highest level of formal education attained by their fathers or male guardians and by their mothers or female guardians. The item scale ranged from 0-8 with (0) none or some grade school, (1) completed grade school, (2) some high school but not a graduate, (3) high school graduate, (4) some college, vocational, or business school after high school, (5) bachelor's degree, (6) master's degree, (7) some work toward Ph.D. or professional degree, or (8) Ph.D. or professional degree. Those respondents indicating parental educational level as 0-4 were considered non-professional; those indicating 5-8 were considered professional for educational purposes.

Even though the total sample was used for analysis, numbers of subjects for each particular analysis varied due to missing information. Chapter IV will provide information on the exact number of subjects used in the various analyses.

Data and Instrumentation

The Educational Quality Assessment Inventory provided data on several performance areas and condition variables pertinent to the factors which contributed to the theory of self-efficacy. Specifically, they were self-esteem, career awareness, parental education, parental occupation, parental expectations, educational expectations, and teacher expectations.

Having suggested, based on self-efficacy, the factors included in the EQA data which contributed to self-efficacy expectations, analysis of that information seemed appropriate to the understanding of the theory of self-efficacy as well as the positive identification of variables which affect self-efficacy expectations in relation to career development of both women and men.

It was also important to determine which factors contributed the most and what the effect of environmental and familial situations was in the development of self-efficacious individuals who believed that their occupational desires and expectations were one and the same.

The data were collected through the cooperation of the EQA staff in providing the data base tapes for the 1981 administration of the survey. Analysis of the data was available through the Pennsylvania State University computer system. The 1981 year was selected because it was the largest and most diverse sample to date. The following describes the measurement of each within the framework of the EQA inventory (Kohr et al., 1982).

Self-Esteem

The self-esteem scale for each grade level was comprised of 32-33 short, descriptive statements worded both positively and negatively. Response items were (1) Strongly Agree, (2) Mostly Agree, (3) Mostly Disagree, and (4) Strongly Disagree. The individual score was the percentage of items to which favorable response was given.

Career Awareness

These scales contained 40-42 items focusing on student knowledge of duties, conditions, training, salary and educational requirements of various occupations.

Parental Education

Students reported the highest level of formal education attained by their mothers, fathers or guardians from 148 occupations.

Parental Occupation

Students reported the occupation most like their mother's or father's or guardian's from 148 occupations.

Parental Expectations

Students reported their perceptions on (1) what their parents encouraged them to do and (2) how much schooling their parents expected them to complete.

Educational Expectations

Students reported how far they expected to go in school.

Teacher Expectations

Students reported their perceptions of their teacher's expectations of them.

Analysis of Data

The data were analyzed statistically by way of multiple regression, analysis of variance, and T-tests. Bonferonni follow-up tests were conducted on all analysis of variance tests which proved significant. In addition, Cohen (1969) "D" coefficients were calculated to compare the means and to determine sizes of effect as small, medium or large.

An initial concern was to verify the performance goals and condition variables that were arbitrarily identified, based on self-efficacy theory, as contributing to a proxy measure of self-efficacy, the dependent variable. A multiple regression analysis was performed based on the regression equation of Self-Efficacy (OCDESIRE-OCEXPECT) = Self-Esteem + Career Awareness + PAREDUC + PAREOCC + PAREXP + EDEXPECT + STEACHEX. A stepwise regression was performed to determine the contribution of the variables as well as correlations to substantiate such contributions.

The next analysis was to utilize the total population sample in a measurement of self-efficacy as the dependent variable to compare self-efficacy expectations among (1) rural versus suburban versus urban populations and (2) traditional versus dual career versus single parent populations through analysis of variance techniques. A comparison between self-efficacy expectations of men versus women was also conducted.

Analysis of each of the subgroups was accomplished through a comparison based on the unique characteristics identified by the study as well as a comparison between men and women subjects in each of the subgroups. Analyses were performed based on the total population sample as well as for the sample of females only.

The EQA offered data which were conducive to attaining the objectives of the study in accessing the data and in the analysis of the data. Chapter IV will present the findings of the study.

CHAPTER IV

RESULTS OF THE STUDY

The data from the 1981 data tape of the Educational Quality Assessment Inventory of 11th grade students were obtained through The Pennsylvania State University. This chapter reports the findings from the analyses of the data.

Descriptive Statistics

From a total sample of 37,942 eleventh grade students in Pennsylvania high schools, subjects were obtained for study of the variables on the EQA Inventory which were identified as pertinent to this study. In the reporting of data involving parental occupations, student occupational desires and student occupational expectations, both the actual occupational code and the weighted occupational code (as described in Chapter III) were obtained. Additional variables included (1) community type, (2) sex, (3) race, (4) parental education, (5) parental expectations, (6) teacher expectations, and (7) educational expectations. In addition, frequencies of students reporting for the goal areas of (1) self-esteem, (2) career awareness, and (3) creative opportunities were obtained. According to the design of the study, these variables were used to classify subjects into groups used for analysis purposes.

Table 1 provides the frequencies of subjects used in a comparison of self-efficacy expectations based upon (1) environmental situation (rural, suburban and urban) and (2) family situation (traditional, dual career, and single parent). Missing values in student completion of the EQA Inventory account for a less than complete sampling of the total population.

Table 1

Frequency Distribution of Subjects Within Major Groups

Classification	N	
Rural	16,772	
Suburban	8,590	
Urban	6,976	
Total		32,338
Traditional	12,244	
Dual Career	11,713	
Single Parent	1,821	
Total		25,778

Based on environmental situations, the total sample consisted of 52% from rural environments, 27% from suburban environments, and 21% from urban environments. By far, the largest group in the sample was for environmental situation analyses (32,338). A smaller number of subjects (25,778) was obtained for comparing family situations.

Students who reported living in a dual career family unit made up 45% of the sample. Those from a traditional family comprised 47% of the students, and 8% were from single parent families. Table 2 provides a frequency distribution by sex and race.

Table 2

Frequency Distribution for Sex and Race

Classification	N	
Sex		
Female	18,652	
Male	18,836	
Total		37,488
Race		
White	33,411	
Black	2,772	
Other	963	
Total		37,146

The number of males and females was nearly equal in the sample. White students predominated in the sample group with 90% reporting that they were of the Caucasian race. Seven percent indicated that they were black and 3% considered themselves as a race other than black or white. A further analysis of each of the subgroups resulted in the frequency distribution depicted in Table 3.

Table 3

Frequency Distribution of Subjects
Within Subgroups

Classification	N	
Rural Sample		
Farm	9,906	
Non-Farm	6,866	
Total		16,772
Suburban Sample		
Mother Professional	1,521	
Mother Non-Professional	1,884	
Total		3,405
Urban Sample		
White	5,369	
Black	1,279	
Other	241	
Total		6,889

Table 3 (Continued)

Classification	N	
Traditional Sample		
Father Professional Mother Non-Professional	3,540	
Father Non-Professional Mother Non-Professional	7,808	
Father Professional Mother Professional	690	
Father Non-Professional Mother Professional	206	
Total		12,244
Dual Career Sample		
Father Professional Mother Non-Professional	2,820	
Father Non-Professional Mother Non-Professional	6,699	
Father Professional Mother Professional	1,503	
Father Non-Professional Mother Professional	691	
Total		11,713

Analysis of the Data

Self-efficacy was defined as the belief that a person has that one can attain certain levels of vocational goals and that one can envision themselves acquiring the necessary education to reach those goals. The proxy measure of self-efficacy, the dependent variable, was the differential between student occupational desire and occupational expectations. A comparison of both the actual occupational code and the weighted occupational code was done. Because of its length it is provided in Appendix A. Appendix B provides descriptions of the weightings by occupational code. Weightings were determined by sociological assessment of occupations based upon salary and educational levels.

Since self-efficacy expectation (the dependent variable) was measured by discrepancy values between occupational desire and occupational expectation, it is interesting to note the discrepancies by frequency of subjects both utilizing occupational codes and weightings by occupation.

Positive differentials occurred in the more professionally oriented, higher paying occupations. The negative differentials occurred in the less professionally oriented, lower paying occupations. In the measurement of self-efficacy used in the study, both positive and negative differentials indicate a discrepancy in self-efficacy expectations because occupational desire does not match occupational expectation.

Referring to Appendix A and based on occupational codes, the highest positive differentials of greater than 100 subjects were found

in the occupations of musician (382), pilot (302), veterinarian (283), forester or conservationist (258), lawyer or judge (246), physician (245), actor or announcer (212), architect (211), flight attendant (202), photographer (196), laborer (125), police officer or detective (112), and therapist (106). The lowest differentials indicating a discrepancy value of zero were transportation laborer, postal official, meter reader, butcher or meat cutter, official of a government office, and manager or owner of a motel/bar/restaurant.

The highest negative differentials of greater than 100 subjects were found in the occupations of housewife (-672), stenographer or secretary (-281), member of the Armed Forces (-221), retail sales clerk or cashier (-190), waiter or waitress (-174), industrial laborer (-162). These occupations could be considered the lower paying and less skilled types of vocational goals. The lowest differentials indicating a discrepancy value of only one were structural metal worker, manager or owner of a bank or financial institution, mathematical specialist and clergyperson.

Referring to the weighted occupational codes reported in Appendix B, the largest positive differentials of over 100 subjects were found to be in occupational weightings of 99 (802), 49 (382), 94 (337), 78 (258), 71 (212), 97 (211), 69 (204), 75 (193), 73 (109), and 80 (100). In order, the occupations associated with the weightings by frequency differential include physician, dentist, optometrist or podiatrist, veterinarian, lawyer or judge (802); welder or flame cutter, bank teller or musician (382); pharmacist, pilot, farm management advisor, or engineer (337); postal official, forester or conservationalist (258);

actor or announcer (212); architect (211); flight attendant, railroad equipment operator and appliance or office machine repairer (204); librarian or curator, manager/owner of a repair service, or photographer (193); therapist or tool and die maker (109); and office manager or supervisor, buyer or purchasing agent, credit worker, manager/owner of a motor vehicles dealership, and draftsperson or artist (100). Differentials of zero were found for the occupations of registered nurse, inspector of vehicles, dispatcher, printing craftsworker, recreation worker, and butcher or meat cutter.

The highest weighted differentials of discrepancies over 100 subjects reporting were found in occupational weightings of 1 (-672), 57 (-285), 32 (-206), 19 (-205), 20 (-172), 42 (-164), 24 (-139), and 23 (-125). Again in order, the occupations associated with the weightings by frequency differential include housewife (-672); stenographer or secretary or manager/owner of a service station (-285); operator of industrial equipment, cement or concrete finisher, roofer or painter, or retail sales clerk or cashier (-206); waiter or waitress, janitor or cleaner (-205); textile operative or industrial laborer (-172); miner or quarry worker, carpenter, cabinetmaker or plasterer, bartender, or member of the Armed Forces (-164); packer, wrapper or grader, construction laborer, or service station attendant (-139); and communication or public utility laborer (-125). The lowest differentials indicating a value of only one were industry/factory owner or manager, manager/owner of an insurance or real estate agency, mathematical specialist, manager or owner of a bank or financial institution, transportation laborer, tailor, or messenger.

Significance Testing

The data were analyzed to provide answers to the questions raised in Chapter I. Tests of significance were performed to provide comparisons of self-efficacy expectation for each of the major groups (rural, suburban, urban, traditional, dual career and single parent) and subgroups identified by the study. Analysis of variance techniques were applied when a comparison of more than 2 groups was necessary. Comparison of only 2 groups was accomplished through t-tests. An alpha level of .05 was used for all tests of significance. Within each of the major groups and subgroups, comparisons were also provided for (1) the total sample, (2) males vs. females, and (3) the female sample only. Bonferroni follow-up tests were utilized to determine differences between groups for all analysis of variance tests. Finally, Cohen's D coefficient was calculated after the follow-up tests to determine the size of the effect between the means. The following section reports on those analyses.

Total Residence Family Sample--
A Comparison of Major Groups

QUESTION 1: Is there a difference in self-efficacy expectations among 11th grade students from different socio-economic environments, specifically rural, suburban, and urban?

QUESTION 2: Is there a difference in self-efficacy expectations among 11th grade students based upon different family backgrounds in terms of parental participation in the work force--traditional, dual career, and single parent?

QUESTION 3: Is there a difference in self-efficacy expectations between males and females?

The first three questions of the study were addressed separately by the analyses of the data but were reported on the same tables so that comparisons of the major groups involved in the study could be easily made.

The findings suggest that students who live in suburban environments exhibit higher levels of self-efficacy expectations than those from either urban or rural environments, with rural students exhibiting the lowest levels of self-efficacy. In addition, students from families where both parents work outside the home are the most self-efficacious, followed by those from either traditional or single parent families. Finally, female students involved in the study consistently exhibited lower levels of self-efficacy than the males in the study. The following section reports the results of the data analyses.

Analysis of variance on self-efficacy expectations as measured by occupational desire minus occupational expectations was performed on each of the two comparisons of major groups identified by the study. The first was a comparison of environmental situations--rural, suburban and urban. The second was a comparison of family situations--

traditional, dual career and single parent. Additional comparisons were of males vs. females and the female sample. The following tables present the results of the significance tests as well as the results of the follow-up tests.

Table 4

Significance of Differences in Self-Efficacy Expectations for the Total Sample

Sample	N	F or T Value	PR > .05
Rural vs. Suburban vs. Urban	37,942	29.75	0.0001
Traditional vs. Dual vs. Single Parent	37,942	9.39	0.0001
Males vs. Females	32,940	-10.5067	0.0001

Table 4 shows that all three tests for significance indicated that differences were not due to chance. However, with these tests and all remaining analyses, it is important to take into consideration the fact that due to such a large sample size, significance is not difficult to achieve. Nonetheless, the findings prove that there are differences in self-efficacy expectations between the groups.

While both comparisons of differences between groups were significant at the .05 level, it should be noted in referring to Table 5 that the comparison of family situations resulted in a slightly lower level of significance than did the comparison based on residential situations. This finding may indicate that self-efficacy

Table 5

Significance of Differences in Self-Efficacy Expectations for the Female Sample

Sample	N	F or T Value	PR > .05
Rural vs. Suburban vs. Urban	18,652	20.44	0.0001
Traditional vs. Dual vs. Single Parent	18,652	4.61	0.0099

expectations for females are influenced slightly more as a result of environmental situations than family situations. Table 6 provides a comparison of means for self-efficacy expectations for the major groups involved in the study.

In the comparison of means for rural, suburban and urban populations reported in Table 6, the minimum significant difference value was 0.71811 for the total sample and 1.05234 for the female population. Significant differences in self-efficacy expectations were found between rural and suburban, rural and urban, and urban and suburban of the total sample, thus indicating that self-efficacy expectations of those three groups based on the total sample are different, not due to chance, with the suburban sample being the most self-efficacious followed by the urban sample. The group showing the least self-efficacy expectations was the rural sample.

The female sample analysis of the same groups indicated a significant difference between rural and urban female samples, and between rural and suburban samples, but not between females in urban vs. suburban residential situations.

Table 6

A Comparison of Means for Self-Efficacy Expectations Based on the Total Sample and Female Sample

Sample	N	Mean	S.D.
Total Sample			
Suburban	8,590	2.6326	19.0831
Urban	6,976	3.7542	20.7616
Rural	16,772	4.7209	21.1874
Dual Career	11,713	3.6594	20.2893
Traditional	12,224	4.0961	20.4693
Single Parent	1,821	5.8863	22.7096
Male	15,866	2.7355	19.5068
Female	16,624	5.1270	21.5071
Female Sample			
Suburban	4,327	3.4904	19.3650
Urban	3,543	4.6042	21.2305
Rural	8,649	6.0302	22.5322
Dual Career	5,808	4.6042	20.6761
Traditional	6,248	5.3470	21.7497
Single Parent	1,052	6.6207	23.5042

The analysis of the total sample based on family situation (traditional, dual career, or single parent) indicated minimum significant differences of 1.07259 for the total sample and 1.50047 for females. Significant differences in the total sample were found between students from dual career families and single parent families and traditional families. No significant difference was found between the traditional and dual career families for the total sample.

In the female sample, the only significant difference was found between dual career families and single parent families, but no significance between dual career vs. traditional, vs. single parent families. In the rank order of means of self-efficacy expectations, however, dual career was greatest followed by traditional and then single parent families.

A Comparison of Subgroups Within the Total Sample

QUESTION 4: Is there a difference in self-efficacy expectations within the subgroups--rural, suburban, urban, traditional, dual career, and single parent--as a result of identified factors inherent to each group?

The results suggest that there is a large difference in self-efficacy expectations between rural males and rural females. It appears that there are also differences based on the professional or non-professional status of mothers from suburban environments. Race seems to affect self-efficacy expectations of students from urban environments, with white students the least self-efficacious. It

should be cautioned that this finding was the result of the measurement of self-efficacy expectations based upon the differential between occupational desires and occupational expectations, not upon levels of occupational desires or occupational expectations. In other words, minorities' desires for lower occupational goals may be more congruent with their expectations.

It was found that in dual career and traditional family samples higher occupational levels of parents result in higher levels of self-efficacy, but not in the single parent family sample. The following section reports the analyses of the data for the subgroup samples.

Rural Sample

The rural sample compared those subjects who lived on a farm with those who lived in a rural community. In addition, comparisons of self-efficacy expectations were made for rural males and rural females as well as rural women alone as depicted in Table 7.

Table 7

Significance of Differences in Self-Efficacy Expectations for the Rural Sample

Sample	N	T Value	PR > .05
Farm vs. Non Farm, Total Sample	16,772	-1.6382	0.1014
Farm vs. Non Farm, Female Sample	8,649	12.1951	0.0282
Rural Males vs. Rural Females	16,946	-8.2969	0.001

As noted in Table 7, there was a significant difference found in both the female sample for farm vs. non-farm and for rural men vs. rural women. However, the difference in the total sample was not significant at the .05 level. It appears that rural males are much more self-efficacious than rural females, but that in considering the total rural group, little difference was found in self-efficacy expectations between those students who reported living on a farm and those from a rural community. Table 8 reports the means and standard deviations for each of the rural subgroups analyzed in the study.

Table 8

A Comparison of Means for Self-Efficacy Expectations Based on the Rural Sample

Sample	N	Mean	S.D.
Total Sample			
Farm	9,906	4.4955	20.6775
Non Farm	6,866	5.0462	21.8996
Male	8,192	3.3190	19.5654
Female	8,754	6.0295	22.5512
Female Sample			
Farm	5,256	5.6953	21.7728
Non Farm	3,393	6.7028	23.6480

The comparison of means based on the differential between OCDESIRE and OCEXPECT in Table 8 confirms that rural students who live on a farm are more self-efficacious than those who live in rural communities. It is also evident from Table 8 that there is a large difference between self-efficacy expectations of rural men and rural women. It is interesting to note that in the female sample, differences in self-efficacy expectations between those females who are considered farm versus those considered non-farm are less than the differences in the total sample.

Because minimum values necessary to show significance between two means were provided only for comparisons utilizing analysis of variance techniques involving more than two means, the analyses of two means utilizing t-tests required further interpretations through Cohen's D Coefficient, which will be reported in the last section.

Suburban Sample

The investigation of the suburban sample centered on the possible differences for self-efficacy expectations depending upon whether the mother was a professional or non-professional. In Table 9, comparisons were made for the total sample, suburban males vs. suburban women, and for suburban females.

Table 9

Significance of Differences in Self-Efficacy Expectations for the Suburban Sample

Sample	N	T Value	PR > .05
Mother Professional vs. Mother Non-Professional Total Sample	4,253	-4.1958	0.0001
Mother Professional vs. Mother Non-Professional Female Sample	1,686	1.4749	0.1404
Suburban Males vs. Suburban Females	8,580	-4.1958	0.0001

Table 9 reports that significant differences were found for the comparison of mother professional vs. mother non-professional for the total sample but not for the female sample. The comparison between suburban males and suburban females proved significant. While significance was achieved for the total sample and for the males versus females, no significance was found for the female sample. The study identified the subgroups for analysis based upon the assumption that mothers provided role models to which female offspring could identify. The results do not support the assumption. Table 10 compares the means for the suburban sample.

Table 10

A Comparison of Means for Self-Efficacy Expectations Based on the Suburban Sample

Sample	N	Mean	S.D.
Total Sample			
Mother Professional	1,521	1.0184	17.8386
Mother Non-Professional	1,884	3.1237	19.3291
Male	4,253	1.7632	18.7642
Female	4,327	3.4904	19.3620
Female Sample			
Mother Professional	752	2.2101	16.5326
Mother Non-Professional	934	3.5128	19.7271

Table 10 shows that large differences in self-efficacy expectations were found in the total sample but not in the female sample. This finding might indicate that suburban females are less influenced by the occupation of the mother than assumed.

Urban Sample

The urban sample was analyzed by race: white, black or other. Again, analyses were performed for the entire urban sample, urban males vs. urban females, and females only. Table 11 depicts self-efficacy expectations for the urban sample. Table 12 compares the means for self-efficacy expectations.

Table 11

Significant Differences in Self-Efficacy Expectations for the Urban Sample

Sample	N	T or F Value	PR > .05
White vs. Black vs. other, Total Sample	8,514	4.90	0.0075
White vs. Black vs. other, Female Sample	4,154	10.79	0.0001
Urban Males vs. Urban Females	6,964	-4.6899	0.0001

As noted in Table 11, all three comparisons proved significant at the .05 level. The racial comparison of significant differences for the total sample was slightly lower than for the female sample, but still proved significant. Again significance was found in the comparison between urban males and urban females.

It appears that there is again a difference in self-efficacy expectations between males and females and between racial groups. It should be noted, however, that the differences in self-efficacy expectations are larger for the total sample, which includes males, than for the female sample alone.

Table 12

A Comparison of Means for Self-Efficacy Expectations Based on the Urban Sample

Sample	N	Mean	S.D.
Total Sample			
White	5,369	4.0654	20.2446
Black	1,279	3.0868	22.1131
Other	241	0.1518	22.8211
Male	3,421	2.5665	20.2159
Female	3,543	4.8959	21.2305
Female Sample			
White	2,771	5.6604	21.1522
Black	631	2.7623	20.9185
Other	110	-1.9545	22.4149

The minimum significant difference for race for the total sample was 2.89491 and for the female sample 4.34538. Table 11 shows that significant differences were found between the total sample means for the comparison between black and other and between white and other but not between white and black. In terms of rankings depicted in Table 12, the means indicate that the highest self-efficacy expectations were reported for the other racial category followed by black and then white. In the female sample follow-up, the means were ranked in the same order, but with significant differences only found between white and other.

Traditional Family Sample

The traditional family style sample was analyzed by the following family situations depicted in Table 13: (1) father professional, mother non-professional; (2) father non-professional, mother non-professional, (3) father professional, mother professional; and (4) father non-professional, mother professional. As with the former analyses, comparisons were made for the total sample, male vs. female, and the female sample.

Table 13 shows all three comparisons for the traditional family sample were significant at the .05 level. The results indicate that for traditional family situations, there are significant differences depending upon the professional status of the two parents. Through analysis of variance tests and t tests, it was found that significant values for the total sample were substantially higher than for either the female sample analysis or for the males vs. females analysis. A further comparison, based on means, is provided in Table 14.

Minimum significant differences for the total sample and the female sample were 3.11901 and 4.6211 respectively, the values between the comparison of means necessary to indicate significance. The findings reported in Table 14 show significant differences between (1) both parents non-professional and both parents professional, (2) the families where neither are professional as opposed to at least the father professional, and (3) at least the mother professional compared to both parents professional for the total sample. In the female sample, significant differences were found between the professional parents vs. non-professional parents and between both parents non-professional vs. at least one parent considered professional.

Table 13

Significant Differences in Self-Efficacy Expectations for Traditional Family Sample

Sample	N	F or T Value	PR > .05
Total Sample			
Father Professional, Mother Non-Professional vs. Father Non-Professional, Mother Non-Professional vs. Father Professional, Mother Professional vs. Father Non-Professional, Mother Professional	13,053	28.48	0.0001
Female Sample			
Father Professional, Mother Non-Professional vs. Father Non-Professional, Mother Non-Professional vs. Father Professional, Mother Professional vs. Father Non-Professional, Mother Professional	6,606	19.66	0.0001
Males vs. Females			
Traditional Family Males vs. Females	12,230	-6.9450	0.0001

Table 14

A Comparison of Means for Self-Efficacy Expectations Based on the Traditional Family Sample

Sample	N	Mean	S.D.
Total Sample			
Father Non-Professional, Mother Non-Professional	7,808	5.3262	21.7200
Father Non-Professional, Mother Professional	206	3.6505	20.8585
Father Professional, Mother Non-Professional	3,540	2.1734	17.7610
Father Professional, Mother Professional	590	0.1739	17.2734
Male	5,982	2.7872	18.9674
Female	6,243	5.3470	21.7497
Female Sample			
Father Non-Professional, Mother Non-Professional	4,020	6.8821	23.5458
Father Non-Professional, Mother Professional	108	2.4907	18.7848
Father Professional, Mother Non-Professional	1,788	2.8909	18.2008
Father Professional, Mother Professional	322	0.9517	14.4997

In the ranking of means reported in Table 14, the total sample resulted in (1) father professional, mother professional as being most self-efficacious followed by (2) father professional, mother non-professional, (3) father non-professional, mother professional and (4) father non-professional, mother non-professional. The rankings for the female sample were slightly different. Those rankings of means were (1) father professional, mother professional, (2) father non-professional, mother professional, (3) father professional, mother non-professional, and (4) father non-professional, mother non-professional.

Dual Career Family Sample

The dual career family sample was analyzed through the same breakdowns as the traditional family sample. Again, comparisons were made for the total sample, the female sample and the males vs. females. Table 15 reports the comparisons.

Once again, in referring to Table 15, all comparisons were significant at the .05 level. The results indicated that there are significant differences for dual career families based on occupational status of the parents. Table 16 compares the means for the dual career family sample.

Minimum significant differences were 1.9303 for the total sample and 2.8453 for the female sample. Significant differences in self-efficacy expectations were found according to Table 16 by inspection between (1) the families where both parents are professional opposed to both parents non-professional, (2) the families where neither is a professional opposed to at least the mother professional; (3) where

Table 15

Significant Differences in Self-Efficacy Expectations for the Dual Career Family Sample

Sample	N	F or T Value	PR > .05
Total Sample			
Father Professional, Mother Non-Professional vs. Father Non-Professional, Mother Non-Professional vs. Father Professional, Mother Professional vs. Father Non-Professional, Mother Professional	12,602	25.71	0.0001
Female Sample			
Father Professional, Mother Non-Professional vs. Father Non-Professional, Mother Non-Professional vs. Father Professional, Mother Professional vs. Father Non-Professional, Mother Professional	6,171	16.43	0.0001
Males vs. Females			
Dual Career Family Males vs. Females	11,696	-5.0114	0.0001

Table 16

A Comparison of Means for Self-Efficacy Expectations Based on the Dual Career Family Sample

Sample	N	Mean	S.D.
Total Sample			
Father Non-Professional, Mother Non-Professional	6,699	5.0163	21.3040
Father Non-Professional, Mother Professional	691	2.9016	18.7254
Father Professional, Mother Non-Professional	2,820	2.1543	19.7986
Father Professional, Mother Professional	1,503	0.7838	16.3768
Male	5,883	2.7254	19.8540
Female	5,808	4.6042	20.6762
Female Sample			
Father Non-Professional, Mother Non-Professional	3,374	6.1592	21.9067
Father Non-Professional, Mother Professional	322	3.4317	17.6855
Father Professional, Mother Non-Professional	1,371	2.8235	20.4767
Father Professional, Mother Professional	841	1.3279	15.0699

neither is a professional as opposed to the father a professional and (4) both parents are professionals as opposed to only the father being a professional. No significant difference was found between family situations where either the mother or father is a professional nor between those family situations where the father is a professional compared to where both father and mother are considered professional. Ranking of the means reported in Table 16 are (1) father professional, mother professional, (2) father professional, mother non-professional, (3) father non-professional, mother professional, and (4) father non-professional, mother non-professional.

In a comparison of the female sample means, significant differences were found again by inspection between family situations where both parents are non-professional and where both parents are professional as well as where both are non-professional and the father is professional. No other significant differences were found. Rankings of means for self-efficacy expectations were (1) father professional, mother professional; (2) father professional, mother non-professional; (3) father non-professional, mother professional; and father non-professional, mother non-professional.

Single Parent Family Sample

The single parent family sample was analyzed by the occupational status of the parent. Designations were (1) father professional, (2) father non-professional, (3) mother professional, or (4) mother non-professional. Comparisons for the female sample and single parent males vs. females were again made. Tables 17 and 18 report the results of the analyses of students from single parent families.

Table 17

Significant Differences in Self-Efficacy Expectations for the Single Parent Family Sample

Sample	N	F or T Value	PR > .05
Total Sample			
Father Professional vs. Father Non-Professional vs. Mother Professional vs. Mother Non-Professional, Total Population Sample	1,957	1.27	0.2813
Female Sample			
Father Professional vs. Father Non-Professional vs. Mother Professional vs. Mother Non-Professional, Female Sample	1,112	1.15	0.3285
Males vs. Females			
Single Parent Family Males vs. Females	1,818	-1.5963	0.1106

Table 18

A Comparison of Means for Self-Efficacy Expectations Based on the Single Family Sample

Sample	N	Mean	S.D.
Total Sample			
Father Professional	123	5.7561	21.7102
Father Non-Professional	266	5.0489	23.8763
Mother Professional	255	3.5804	18.3133
Mother Non-Professional	436	6.8578	22.2145
Males	766	4.9217	21.5773
Females	1,052	6.6207	23.5042
Female Sample			
Father Professional	56	5.3929	22.7817
Father Non-Professional	142	4.7113	23.7247
Mother Professional	132	4.8788	19.0444
Mother Non-Professional	257	8.3035	22.6809

Even though there were no significant differences found, Table 18 shows that in the total sample, students from single-parent families where the mother was a professional were the most self-efficacious based on a comparison of the means for self-efficacy. In the female sample, highest levels of self-efficacy were reported where again the mother was a professional and also where the father was a non-professional. Differences between means for males and females is evident.

As can be seen in Table 17, none of the analyses were significant at the .05 level. With minimum significant differences of 5.46648 for the total sample and 7.9219 for the female sample, none of the self-efficacy means were significantly different for the single parent family sample.

Comparison of Means for Size and Effect

The final analysis was a comparison of means using Cohen's D coefficient to determine the size of the effect. According to Cohen (1969), the size of the effect between two means is accomplished by "standardized the raw effect size as expressed in the measurement unit of the dependent variable by dividing it by the (common) standard deviation of the measures in their respective populations" (p. 18). The measurement of a D coefficient indicates that the means differ by tenths of a standard deviation with 1.0 being the highest coefficient possible. A small effect size would be .2; a medium effect size, .5; and a large effect size, .8. Because of the large sample size, all effects were considered small by D coefficient standards. However,

it is important to the study to see which comparisons of means created the largest D coefficient and which created the smallest. Tables 19 and 20 report the D coefficients based on the comparison groups first of all and then by rankings.

By and large, the greatest effect was produced by the comparison of the rural and suburban total samples (0.48). This effect came closest to a medium effect between means defined by Cohen as 0.50. The next largest effect was found in the comparison of the traditional sample where neither parent was a professional compared with both parents professionals (0.25). Closely following was the same comparison for the dual career sample resulting in a coefficient of 0.21 The least effect was found in the comparison of traditional and dual career families based on the total sample. While the effects are small by D coefficient standards and perhaps due to large sample size, the value of the comparison is an inspection of those comparisons with the highest and lowest D coefficient effects based upon statistical analysis.

Table 1°

A Comparison of Means Based on
Cohen's D Coefficient

Comparison	D
Total Sample:	
Rural - Urban	0.05
Rural - Suburban	0.48
Urban - Suburban	0.06
Traditional - Dual	0.02
Dual Career - Single Parent	0.11
Traditional - Single Parent	0.09
Male - Female	0.12
Rural Sample:	
Farm - Non-Farm	0.03
Male - Female	0.13
Suburban Sample:	
Mother Professional - Mother Non-Professional	0.11
Male - Female	0.09
Urban Sample:	
White - Black	0.05
Black - Other	0.13
White - Other	0.19
Male - Female	0.11

Table 19 (Continued)

Comparison	D
Traditional Sample:	
Father Non-Professional, Mother Non-Professional - Father Non-Professional, Mother Professional	0.08
Father Non-Professional, Mother Professional - Father Professional, Mother Non-Professional	0.08
Father Professional, Mother Non-Professional - Father Professional, Mother Professional	0.11
Father Non-Professional, Mother Non-Professional - Father Professional, Mother Non-Professional	0.15
Father Non-Professional, Mother Professional - Father Professional, Mother Professional	0.19
Father Non-Professional, Mother Non-Professional - Father Professional, Mother Professional	0.25
Male - Female	0.13
Dual Career:	
Father Non-Professional, Mother Non-Professional - Father Non-Professional, Mother Professional	0.10
Father Non-Professional, Mother Professional - Father Professional, Mother Non-Professional	0.04
Father Professional, Mother Non-Professional - Father Professional, Mother Professional	0.07

Table 19 (Continued)

Comparison	D
Father Non-Professional, Mother Non-Professional - Father Professional, Mother Non-Professional	0.14
Father Non-Professional, Mother Professional - Father Professional, Mother Professional	0.12
Father Non-Professional, Mother Non-Professional - Father Professional, Mother Professional	0.21
Male - Female	0.09
Single Parent:	
Father Professional - Mother Non-Professional	0.05
Father Professional - Father Non-Professional	0.03
Father Non-Professional - Mother Professional	0.07
Father Non-Professional - Mother Non-Professional	0.08
Father Professional - Mother Professional	0.11
Mother Professional - Mother Non-Professional	0.16
Male - Female	0.07

Table 20

Rankings of Comparisons of Means Based on Cohen's D Coefficient

Comparison	D
Total Sample: Rural - Suburban	0.48
Traditional: Father Non-Professional, Mother Non-Professional - Father Professional, Mother Professional	0.25
Dual Career: Father Non-Professional, Mother Non-Professional - Father Professional, Mother Professional	0.21
Urban Sample: White - Other	0.19
Traditional Sample: Father Non-Professional, Mother Professional - Father Professional, Mother Professional	0.19
Single Parent: Mother Professional - Mother Non-Professional	0.16
Traditional: Father Non-Professional, Mother Non-Professional - Father Professional, Mother Non-Professional	0.15
Dual Career: Father Non-Professional, Mother Non-Professional - Father Professional, Mother Non-Professional	0.14
Rural: Male - Female	0.13
Urban: Black - Other	0.13
Traditional: Male - Female	0.13
Total Sample: Male - Female	0.12
Dual Career: Father Non-Professional, Mother Professional - Father Professional, Mother Professional	0.12
Total Sample: Dual Career - Single Parent	0.11

Table 20 (Continued)

Comparison	D
Suburban: Mother Professional - Mother Non-Professional	0.11
Urban: Male - Female	0.11
Traditional: Father Professional, Mother Non-Professional - Father Professional - Mother Non-Professional	0.11
Single Parent: Father Professional - Mother Professional	0.11
Dual Career: Father Non-Professional, Mother Non-Professional - Father Non-Professional, Mother Professional	0.10
Total Sample: Traditional - Single Parent	0.09
Suburban: Male - Female	0.09
Dual Career: Male - Female	0.09
Traditional: Father Non-Professional, Mother Professional - Father Non-Professional, Mother Professional	0.08
Traditional: Father Non-Professional, Mother Professional - Father Professional, Mother Non-Professional	0.08
Single Parent: Father Non-Professional - Mother Non-Professional	0.08
Dual Career: Father Professional, Mother Non-Professional - Father Professional, Mother Professional	0.07
Single Parent: Father Non-Professional - Mother Professional	0.07
Single Parent: Male - Female	0.07
Total Sample: Urban - Suburban	0.06

Table 20 (Continued)

Comparison	D
Total Sample: Rural - Urban	0.05
Urban: White - Black	0.05
Single Parent: Father Professional - Mother Non-Professional	0.05
Dual Career: Father Non-Professional, Mother Professional - Father Professional, Mother Professional	0.04
Rural: Farm - Non-farm	0.03
Single Parent: Father Professional - Father Non-Professional	0.03
Total Sample: Traditional - Dual Career	0.02

Regression Equation for Self-Efficacy Expectations

QUESTION 5: Is there a correlation between certain condition variables measured by the EQA and contributions to self-efficacy, i.e., self-esteem, career awareness, parental education, parental occupation, parental expectations, educational expectations, teacher expectations, and creative opportunities?

One analysis performed was to try to identify the goal areas and condition variables from the EQA Inventory that might contribute to self-efficacy expectations based on Bandura's theory. Relating to the sources identified by Bandura as contributing to self-efficacy expectations (performance accomplishment, vicarious experience, verbal reinforcement and emotional arousal), three performance goal areas and seven condition variables were identified from the EQA Inventory. The goal areas of self-esteem, career awareness and creative opportunities seemed to provide possible contributions to performance accomplishments. Parental education and parental occupation seemed to relate to vicarious experience. Verbal reinforcement seemed to relate to parental expectations and teacher expectations. Finally, it seemed possible that emotional arousal could correlate with occupational desire, occupational expectation, and educational expectation. Of all the variables measured by the EQA inventory, two seemed to be appropriate for use as a proxy measure of self-efficacy--occupational desire minus occupational expectation. Using the total population sample, the resulting equation for analysis was:

Self-Efficacy (OCDESIRE-OCEXPECT) = Self-Esteem +
Career Awareness + Creative Opportunity + PAREDUC +
PAROCC + PAREXP + EDEXPECT + STEACHEX.

Because of the administration of 4 equivalent forms of the inventory in an effort to reduce the number of items each student was requested to complete, the scores for each of the goal areas were standardized resulting in means of 50 and standard deviations of 10. The reporting of frequencies of subjects in each of the goal areas is, therefore, by mean range, and deviation from the mean. The reporting of the condition variables is by frequency. In addition, percentages of each category were calculated.

Goal Areas and Condition Variables

Self-Esteem. Students were asked to relate their feelings of success or feelings of acceptance--primarily in the school setting. Sample items included statements by which students could express their feelings about the areas of their lives which might contribute to self-esteem. Response choices to items were (1) Strongly Agree, (2) Mostly Agree, (3) Mostly Disagree, or (4) Strongly Disagree. Values ranged from 78 to 5 with a missing value count of 1,229. Table 21 reports the results for the self-esteem scores.

Table 21

Standardized Scores for Self-Esteem

N	Range	Mean	Standard Deviation
35,812	73	49.9501	10.0646

Career Awareness. Students were queried on their awareness of duties, training, abilities and educational requirements of various occupations, an understanding of labor market conditions, and skills in gathering such data, such as knowledge of occupational clusters and publications. Sample items included career awareness questions with multiple choice responses. Values ranged from 76 to 19 with a missing value count of 794. Table 22 provides the results from the career awareness measurement of the EQA.

Table 22

Results of Standardized Scores for Career Awareness

N	Range	Mean	Standard Deviation
37,148	57	49.653	9.99275

Creative Opportunities. Students were asked to indicate the frequency of participation in five areas: visual arts, performing arts, writing, science, and social and practical studies. Sample items asked students what activities they had participated in during the past three years. Response choices were (A) have not done the activity, (B) have done the activity once, (C) have done the activity 2 or 3 times, (D) have done the activity about 5 times or (E) have done the activity about 8 times or more. Values ranged from 95 to 20 with a missing value count of 2130. Table 23 represents the results of the measurement for creative opportunities.

Table 23

Results of Standardized Scores for Creative Opportunities

N	Range	Mean	Standard Deviation
35,812	75	46.2057	11.9928

Of the three goal areas studied, the frequency of subjects based upon standard scores found that two fell within one standard deviation, those being self-esteem and career awareness. The third goal area of creative opportunities was slightly above one standard deviation from the mean. For the most part, the data indicate a normal curve with approximately 68% of the subjects falling within +1 and -1 standard deviations from the mean.

Parental Education. Regarding parental education, students reported the highest level of formal education attained by (1) their fathers or male guardians and (2) their mothers or female guardians. Responses were classified according to 9 levels of education. Those levels reported on the EQA were (1) Ph.D or professional degree; (2) some work toward a Ph.D or professional degree; (3) Master's degree; (4) Bachelor's degree; (5) some college, vocational or business school after high school; (6) high school graduate; (7) some high school, but not a graduate; (8) completed grade school; (9) none or some grade school. Table 24 summarizes the data concerning parental educational levels. Also summarized are those educational levels of both mothers and fathers of subjects by ranking and comparison of the two.

Table 24

Rankings of Parental Educational Levels by Frequency

Educational Level	N	%
High school graduate	15,704	42.1
Some college, vocational or business school after high school	9,196	24.7
Some high school, but not a graduate	3,660	9.8
Bachelor's degree	3,557	9.5
Master's degree	2,263	6.1
Ph.D. or professional degree	1,695	4.5
Some work toward Ph.D. or prof. degree	732	2.0
Completed grade school	321	.7
None or some grade school	141	.4
	37,269	

Table 24 presents parental educational levels by ranking. Because educational level is important in relation to attained occupational level, the table presents data which are of particular relevance to the study.

Referring to Table 24, it should be noted that almost half the parents were high school graduates and that another 25% obtained some college, vocational or business school after high school. Approximately 1% of the parents had not completed grade school while almost 10% had

not completed high school. This results in a total of approximately 11% of the parents who did not hold a high school diploma. Table 25 presents educational levels of the fathers and mothers reported in the study to provide an understanding of parental educational background which relates to occupational status of the parents, a contributing factor to self-efficacy expectations of the offspring.

Table 25

A Comparison of Father and Mother Occupational Status by Frequency and Percentage of Total Sample

Educational Level	Father		Mother	
	N	%	N	%
Ph.D. or professional degree	1,394	3.8	534	1.4
Some work toward Ph.D. or professional degree	461	1.2	428	1.2
Master's degree	1,911	5.2	1,016	2.7
Bachelor's degree	3,109	8.4	2,256	6.1
Some college, vocational, business school after graduation	7,193	19.5	6,901	18.6
High school graduate	13,956	37.7	18,829	50.6
Some high school, not a graduate	7,347	19.9	6,216	16.7
Completed grade school	1,128	3.1	663	1.8
None or some grade school	483	1.3	306	.01

Over three-fourths of the fathers had at least completed high school. Of those completing high school, nearly 40% engaged in post-secondary educational pursuits. A little less than 25% had not completed high school. One notes that over 50% of the mothers were high school graduates. Thirty percent have pursued education beyond the high school level. Sixteen percent have not obtained a high school diploma. Reportings of occupational levels indicate that the highest percentage were high school graduates, 37.7% of the fathers and 50.7% of the mothers. Approximately 20.0% of the fathers had not completed high school compared with 16.7% of the mothers. Some post high school education was reported for 19.5% of the fathers and 18.6% of the mothers. Eight percent of the fathers and 6.1% of the mothers held bachelor degrees. The discrepancies between the percentage of fathers compared to the percentage of mothers holding advanced degrees is of interest. A total of 9.0% of the fathers hold either a master's degree, a Ph.D., or a professional degree compared with only 4.1% of the mothers.

Parental Occupation. Students were asked to report the occupation of both their father or male guardian and of their mother or female guardian. The occupations were weighted in the same fashion as reported in Appendix B. For a total parental occupational value, the higher level between the two reported levels for father and mother was used to indicate primary family support by either male or female parent.

Parental occupation was also reported by actual occupational level and by weighting for both fathers and mothers. Appendix C summarizes parental occupational levels of both mothers and fathers by frequencies and weightings.

The occupations with the largest frequencies (over 1400) were industrial supervisor, electrician, mail carrier or clerk, manager/owner of a food store (2016); machinist or millwright, construction foreperson, plumber or pipe fitter (1890); housewife (1872); dental assistant, assembler, truck driver or office clerk (1658); pharmacist, pilot, farm management advisor, or engineer (1569); and office manager or supervisor, buyer or purchasing agent, credit worker, manager/owner of a motor vehicles dealership, draftsperson or artist (1475). The occupations with the smallest frequencies (under 50) were dry wall installer or lather (36); recreation worker (36); farm laborer (25); taxi driver (23); paperhanger (20); and actor or announcer (16).

Of the 148 occupational codes and 4 special categories only 42 indicated that the number of mothers engaged in those occupations exceeded that reported for fathers. In 33 occupations, differences of more than 200 were seen between the number of fathers engaged in the occupation minus the number of mothers. Tables 26 and 27 identify occupations according to differences.

Table 26

Ranking of Occupations for Which Father Frequencies vs. Mother Frequencies Exceeded 200 N

Occupation	Difference
Mechanic	1404
Truck Driver	1362
Engineer	1220
Machinist or Millwright	1075
Industrial Manager or Owner	908
Industrial Supervisor	871
Carpenter, Cabinetmaker or Plasterer	675
Industrial Laborer	606
Electrician	599
Metal Worker	584
Pensioned	577
Welder or Flame-cutter	521
Construction Foreperson	410
Farmer	410
Construction Laborer	406
Heavy Equipment Operator	387
Police Officer or Detective	374
Industrial Salesperson	374
Computer Specialist	355

Table 26 (Continued)

Occupation	Difference
Operator of Industrial Equipment	338
Construction Manager/Owner	325
Accountant or Auditor	325
Education Administrator or Professor	314
Tool and Die Maker	300
Miner or Quarry Worker	296
Wholesale or Retail Salesperson	283
Plumber or Pipe Fitter	272
Physician	259
Insurance Agent	258
Crane, Derrick or Hoist Operator	212
Furnace Tender, Smelter or Pourer	210
Fork Lift or Tow Motor Operator	210
Draftsperson or Artist	205

Table 27

Ranking of Occupations for Which Mother Frequencies Exceeded Father Frequencies

Occupation	Difference
Housewife	13,308
Stenographer or Secretary	1,772
Registered Nurse	1,051
Retail Sales Clerk or Cashier	810
Hospital Attendant or Nursing Aide	648
Office Clerk	555
Bookkeeper	545
Waiter or Waitress	539
Office Machine Operator or Typist	477
Cook	474
Textile Operative	454
Practical Nurse	427
Library Assistant or Teacher Aide	395
Teacher or Guidance Counselor	353
Unemployed	304
Bank Teller	271
Packer, Wrapper or Grader	210
Barber or Beautician	182
Factory Assembler	168
Student	162
Manager/Owner of a Clothing Store	130

Table 27 (Continued)

Occupation	Difference
Telephone Operator	125
Dietitian	104
Social Worker	91
Real Estate Agent	89
Janitor or Cleaner	84
Dental Assistant	84
Bill or Account Collector	75
Medical or Dental Technician	71
Librarian or Curator	71
Bus Driver	53
Office Manager or Supervisor	38
Recreation Worker	27
Therapist	26
Bartender	24
Baker	18
Decorator or Window Dresser	14
Messenger	7
Glazier	4
Flight Attendant	4
Transportation Agent	3
Home Management Advisor	1

It is obvious that the occupations in which the number of fathers was greater than the number of mothers are the traditionally male dominated occupations. Occupations which were predominated by the mothers were also those occupations which are traditionally female dominated. Table 28 compares the means and standard deviations of the weighted occupational codes for total parental occupations reported and for fathers and mothers separately.

Table 28

Summary of Parental Occupational Weightings

	N	Mean	Standard Deviation
Parental Occupations	35,163	62.2079	26.3892
Fathers' Occupations	34,667	57.0574	29.0951
Mothers' Occupations	34,374	29.7698	30.9785

As can be seen from Table 28 the weighted occupational mean for mothers is quite a bit lower than that for fathers. The mean for the fathers does not appear too different from that of the total reporting for parental occupations based on the higher of the two values reported. This would indicate that, in most cases, the father's occupational code was the higher of the two and was therefore the one used to obtain the values for parental occupation which was used in the regression formula for self-efficacy.

Parental Expectations. Parental expectations were collected from self-reported student perspectives. Students reported their perceptions on (1) what their parents encouraged them to do and (2) how much schooling their parents expected them to complete. Weighted response selections for Item One were (3) to be one of the best students in the class, (2) to be an above average student in the class, (1) to be at least an average student, or (0) to do just well enough to get by. Weighted response selections for Item Two were (4) beyond college graduation, (3) graduation from college, (2) some college or other post-high school training, (1) graduation from high school, or (0) some high school. Unfortunately, the data report did not allow for frequency breakdowns based upon each of the response selections. Instead, responses to the two items were combined to provide a value for parental expectations. As can be seen in Table 29, a higher value indicates that students feel that their parents expect them to do better in school and to achieve higher educational levels. A total of 34,353 students responded to this item with 3,589 missing values.

Unfortunately, the combination of the two response item scores did not allow for a more definitive reporting for the parental expectation condition variables. However, 63% of the students perceived that their parents expected them to be in the top half of the rating scale and less than 1% felt that their parents expected them to be in the lower two categories of parental values for expectations.

Table 29

Parental Expectation Values by Frequency

Score	N	Score	N
8	1677	4	5776
7	5292	3	6737
6	7813	2	1062
5	5900	1	96
		Total	34,353
		Mean	5.0177
		SD	1.59946

Educational Expectations. In this item, students reported how far they expected to go in school. Response choices included (4) beyond college graduation, (3) graduation from college, (2) some college or post-high school training, (1) graduation from high school, or (0) some high school. Frequencies of responses for each of the educational expectation categories appear in Table 30. The results were based on a total subject response of 37,428 with 514 missing values.

As Table 30 indicates, the highest percentage of students expect to graduate from college followed by those who expect to graduate from high school. While 8,869 expect to engage in some post-high school education, only 4,773 expect to continue an education beyond the baccalaureate level. A mean of 2.3 indicates that the average expectation is beyond the high school level of education.

Table 30

Student Educational Expectations Responses
by Frequency

Response		N
Beyond college graduation		4,773
Graduation from college		13,072
Some college or post-high school training		8,869
Graduate from high school		10,182
Some high school		532
	Total	37,428
	Mean	2.30384
	SD	1.04688

Teacher Expectations. Students reported their perception of their teachers' expectations of them. Response items were (3) one of the best students in the class, (2) above average in the class, (1) at least an average student, and (0) a below average student. Frequencies by response item is depicted in Table 31. The total number of responses from students was 28,760 with a missing value count of 9,182.

Table 31

Teacher Expectations Responses by Frequency

Response		N
One of the best students in the class		4,704
Above average in the class		11,855
At least an average student		11,725
A below average student		476
	Total	28,760
	Mean	1.72277
	SD	0.748741

Interestingly, only 476 students perceived that their teachers' expectations for their achievement would be below average. The remaining 28,284 students indicated that they perceived that their teachers expected them to be at least average or better.

Regression Analysis of Goal Area and Condition Variable Contributions to Self-Efficacy

To determine if the EQA data were applicable in measuring levels of self-efficacy expectations for 11th grade students in Pennsylvania, multiple regression techniques were used as well as stepwise regression to determine the contribution of the variables. Parental occupation, educational expectations of the student, and career awareness were found to be the most important contributors to higher levels of self-efficacy expectations. Teacher expectations was also important, based on the regression analysis, with parental expectations, the least important contributing factor. Table 32 reports the results of the regression analysis.

Table 32

Multiple Regression Analysis for Self-Efficacy Formula Utilizing EQA Goal Areas and Condition Variables

Variable	Sum of Squares	F Value	PR > F
Self-Esteem	1831.57074597	4.59	0.0321
Creative Opportunity	575.36649006	1.44	0.2298
Career Awareness	9743.15127982	24.42	0.0001
PAREDUC	2739.51242994	6.87	0.0088
PAROCC	7498.16599862	18.80	0.0001
PAREXP	164.91683188	0.41	0.5203
EDEXPECT	21666.44180959	54.31	0.0001
STEACHEX	3673.61916291	9.21	0.0024

Using the .05 alpha level of significance as the criterion, Table 32 suggests that the variables which seemed to contribute to self-efficacy expectations were (1) self-esteem, (2) career awareness, (3) parental education, (4) parental occupation, (5) educational expectations and (6) teacher expectations. The only two variables not found to significantly contribute to self-efficacy expectations were (1) creative opportunity and (2) parental expectations.

In a stepwise regression analysis of the significant variables which were identified as possibly contributing to the dependent variable of self-efficacy, Table 33 depicts the R-Square correlations of the variables which meet the significance level for entry into the model. The significance level of the statistical package utilized for the analysis of data was 0.5. Therefore, parental expectations was excluded from the data report.

Table 33

R-Square Correlations for Goal Areas and Condition Variables

Variable	R-Square
EDEXPECT	0.00946592
PAROCC	0.01088829
Career Awareness	0.01157548
STEACHEX	0.01224373
PAREXP	0.01255384
Self-Esteem	0.01274819
Creative Opportunity	0.01280890

As can be seen through Tables 32 and 33, even though six of the eight variables reached the significance levels of .05 for contribution to self-efficacy expectations, the stepwise regression analysis suggested that the contribution of each of the added variables is not of great importance. An increase from .009, the first variable, to .012, the last variable entered, does not lend much credence to the adequacy of the regression model as a measure of self-efficacy expectations. However, further research may indicate that the regression model is, in fact, adequate but that the data obtained from the EQA inventory may be suspect in their contribution to the model. Since the dependent variable was measured by only the discrepancy between occupational desire and occupational expectation, the regression analysis of the model becomes a matter for consideration and future clarification.

Summary

It is evident from the descriptive statistics, as well as from the analysis of the data, that there are differences in self-efficacy expectations among the groups studied. The findings suggest that:

1. Students who live in suburban environments exhibit higher levels of self-efficacy expectations than those from either urban or rural environments. Rural students exhibit the lowest levels of self-efficacy in relation to career development.

2. Students from families where both parents work outside the home (dual career) are more self-efficacious than those from either traditional or single parent families, although the difference between students from dual career and traditional family situations is small.

3. Female students consistently exhibit lower levels of self-efficacy than males.

4. Self-efficacy expectations for females are influenced more as a result of environmental situations than family situations. It appears that where one lives is slightly more important, in terms of female self-efficacy expectation, than the occupational status of the parents. Because the two factors may not be independent, conclusions should be interpreted with caution.

5. There is not a great difference in self-efficacy expectations between farm and non-farm rural students, but there is a large difference between rural males and females.

6. The role modeling of suburban mothers has an overall effect on the self-efficacy expectations of the students from a suburban environment but little effect when considering only the female offspring.

7. Urban students who are categorized as either black or other are more self-efficacious than white students. It is possible that the black and other students are more self-efficacious as a result of desiring occupations for which they feel that their expectations of attainment are reasonable. The white urban students are the most unrealistic in their aspirations compared to their real expectations.

8. Higher occupational levels of parents result in higher levels of self-efficacy for the offspring from dual career and traditional family situations.

9. Students from single parent families exhibit small differences in self-efficacy expectations as a result of the occupational status of the parent.

10. Teacher expectations is a higher contributing factor to levels of self-efficacy expectations than parental expectations, the least contributing factor. Parental occupation, educational expectations of the student, and career awareness are important in fostering higher levels of self-efficacy.

As predicted, differences in self-efficacy expectations were found in groups from rural, suburban and urban environments as well as those from traditional, dual career and single parent families. The final chapter will deal with a summarization of the findings, the conclusions drawn from the study, and recommendations for further research.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Purpose

The focus of the study was to determine if there were differences in self-efficacy expectations as a result of environmental situations and family situations. The environmental situations included rural, suburban, and urban populations and the family situations were for traditional, dual career and single parent families. The data were obtained from the 1981 administration of the Pennsylvania Educational Quality Assessment Inventory for 11th grade students. Self-efficacy, the dependent variable, was measured through the discrepancy value between occupational desire and occupational expectation.

Subgroups within each of the major groups were identified for comparison by self-efficacy expectations. In designing the study, each subgroup was analyzed according to the factors which might contribute the most to self-efficacy expectations. The rural grouping enabled those students who lived on farms to be compared to those who lived in rural communities. Because role-modeling, especially for females, is an important contribution to self-efficacy expectations, the suburban analysis permitted the comparison of mothers who were professional versus mothers who were non-professional. The urban comparison was between the races of white, black and other. To analyze

familial situations, every possible combination of parental occupational and educational status was considered.

The following five questions were addressed by the study:

1. Is there a difference in self-efficacy expectations among 11th grade students from different socio-economic environments, specifically rural, suburban, and urban?

2. Is there a difference in self-efficacy expectations among 11th grade students based upon different family backgrounds in terms of parental participation in the work force--traditional, dual career, and single parent?

3. Is there a difference in self-efficacy expectations between males and females?

4. Is there a difference in self-efficacy expectations within the subgroups--rural, suburban, urban, traditional, dual career, and single parent--as a result of factors inherent to each group?

5. Is there a correlation between certain condition variables measured by the EQA and contributions to self-efficacy, i.e., self-esteem, career awareness, parental education, parental occupation, parental expectations, educational expectations, teacher expectations, and creative opportunities?

Methods

For each of the major groups and subgroups, tests of significance were obtained for (1) the total sample, (2) the males versus the females in the total sample, and (3) comparisons with the female sample only. Follow-up tests were performed t[illegible]are more than two means.

Cohen's D coefficient, while calculated for a comparison of all means, was the only comparison available for those tests involving two means. D coefficients were calculated for the total sample and for the largest mean differences within the female sample. Consistently, the D coefficients for the two samples did not vary more than one-tenth of a point. This indicated that mean comparisons within the female sample alone were basically the same as the mean comparison for the total population in which they were included. Therefore, it was deemed unnecessary to report the female comparisons separately.

Finally, the performance goal areas and condition variables measured by the EQA which were identified as possibly contributing to self-efficacy expectations were analyzed through multiple regression techniques. A stepwise regression analysis was performed to determine the actual contribution of each variable. This was an attempt to ascertain a formula by which levels of self-efficacy expectations could be predicted.

Sample

The 1981 Educational Quality Assessment Inventory for 11th grade students provided a sample of 37,942 students in Pennsylvania public schools. The size of the sample was quite adequate in testing for significance. According to environmental situations, 52% were from a rural environment, 27% from a suburban environment, and 21% from an urban environment. As for family situations, 47% of the students were from traditional families, 45% from dual career families, and only 8% from families where only one parent was in the family unit. It is not

surprising that in such an agricultural state as Pennsylvania over half the students live in rural areas. Evidence of the increasing numbers of women entering the work force is seen in the almost equal number of traditional families and dual career families.

The number of males and females in the sample were also almost equal. There were only 184 more males than females which provided a good comparison of the two groups for self-efficacy expectations. White students predominated in the sample group with 90% reporting that they were of the white race, 7% of the black race, and 3% considering themselves of a race other than white or black.

In the rural sample there were more students (59%) who reported living on a farm than in a rural community. In the suburban sample, the number of mothers who were professional versus those who were non-professional were almost equal. It was somewhat surprising that the larger number (55%) were non-professional. The opposite might have been expected. The urban sample included 78% whites, 19% blacks, and 3% other races. If only Philadelphia and Pittsburgh had been used in the urban sample, it would be possible that blacks would have been the predominant race.

The traditional family sample showed that, in 64% of the families, neither parent was a professional and in 29% of the families the father was a professional but not the mother. Only 6% of the families showed both parents as professionals and a mere 1% where the mother was a professional but not the father. This reflects the assumption that the number of persons engaged in non-professional occupations exceeds the number who are engaged in professional occupations.

The same rankings occurred in the dual career family sample. However, the percentage of families reporting that neither parent was a professional dropped to 57% and the number reporting that the father was a professional but not the mother dropped to 24%. Increases were found in families where both parents were professionals (6% to 13%) and where the mother was a professional but not the father (1% to 6%).

As might be expected, mothers engaged in non-professional occupations predominated in the single parent sample (43%) followed by equal numbers of families where the mother was a professional (22%) and where the father was a non-professional (22%). Students from single parent families where the father was a professional comprised 12% of the sample; 34% of the single parent families were headed by the father.

Comparisons of occupations in which both mothers and fathers were engaged indicated that the fathers, for the most part, were engaged in occupations which were traditionally male dominated and the mothers in occupations which were traditionally female dominated. The weighted occupational mean for mothers was approximately 30 while the mean for fathers was 57. This would verify the contention that women are engaged in lower skilled and lower paying occupations than those of men.

Educational levels of both mothers and fathers showed that more women (51%) have completed high school than men (38%) and that almost equal percentages of men and women had attended a college, vocational, or business school after graduation from high school. In the attainment of baccalaureate and graduate degrees, the women fell behind. Bachelor's degrees were held by 8.4% of the men and 6.1% of the women.

Master's degrees were held by 5.2% of the men and 2.7% of the women. Ph.D.'s or professional degrees had been attained by 3.8% of the men and 1.4% of the women. The implication is that high school graduation and some post high school training was seen as attainable by the mothers but that fewer of them sought college or advanced degrees as compared to the fathers. This may reflect different expectations for those women when they were growing up as compared to today's expectations.

Findings

The purpose of the study was to determine if there were differences in self-efficacy expectations between environmental situations (rural suburban and urban) and between family situations (traditional, dual career and single parent). The two major groups were factored according to variables identified as important to the study of self-efficacy expectations. The study concluded that self-efficacy expectations do differ depending upon the groups compared and are consistently different between men and women. While some results proved predictable, some results proved unpredictable. Overall, however, the results support the assumptions upon which the study was based and support the concept of self-efficacy differences as related to career aspirations of high school students. The results suggest that self-efficacy expectations might be an important consideration for the vocational counseling of students with implications for vocational education. In addition the theory might suggest intervention strategies to increase and strengthen

self-efficacy expectations in regard to career development for both male and female students.

The study compared self-efficacy expectations among the major groups and subgroups analyzing (1) the total sample, (2) males versus females in the total sample, and (3) the female sample. The dependent variable was measured by a comparison between reported occupational desire and occupational expectation. By frequency, positive differentials and negative differentials indicated discrepancies between occupational desire and occupational expectation. Based on actual occupational codes and weighted occupational codes, the results indicated that the largest positive differentials were found in the highly skilled, higher paying and more prestigious occupations. The largest negative differentials were found in the lower skilled, lower paying and less prestigious occupations. Of special interest was the reporting for the occupation of housewife. Only 290 students indicated a desire to be a housewife but 962 expected to be a housewife. This was the largest differential in the comparison. It suggests that while female students would like to engage in occupations outside the home, they lack self-efficacy, for whatever reason, to reach those goals and instead expect to engage in the role of wife and mother within the home.

Significance testing for self-efficacy among the major groups and subgroups provided evidence of differences in self-efficacy expectations among the groups. In the total sample, significance at the 0.001 level was found between rural, suburban and urban samples; between traditional, dual career and single parent families; and between men and women. Differences in self-efficacy expectations between males and females

were significant at the 0.001 level consistently, with males reporting greater self-efficacy expectations, except for single parent families where no differences were found. In the female sample, the comparison for rural, suburban and urban samples produced differences in self-efficacy significant at the 0.001 level, but the comparison of traditional, dual career and single parent families, while still significant, was at the 0.0099 level.

The comparison of means for the total sample resulted in rankings in self-efficacy expectations with suburban subjects being the most self-efficacious followed by urban and then rural subjects. In the family situation groupings, the students coming from dual career families were the most self-efficacious followed by those from traditional and single-parent family situations. The same results were obtained from the female sample comparison with a wider spread between the mean values as a result of the environmental situations than for the family situations.

Follow-up tests using Bonferroni comparisons of the means revealed that the only nonsignificant difference was between traditional and dual career family situations in the total sample for family situations. A significant difference for family situations was found between dual career families and single parent families. It appears that traditional and dual family situations do not significantly differ in resulting self-efficacy expectations of the offspring. However, single parent families seem to significantly differ from either traditional or dual career families in terms of self-efficacy expectations because none of the comparisons used in the study were found to be significant.

In the rural sample, there were significant differences between males and females and between females classified as living on a farm or in a rural community. There was no significant difference between farm and non-farm for the total sample. It appears that rural males are much more self-efficacious than rural females and both males and females were included in the total sample. The differences in means for males (3.3109) and for females (6.0295) showed the greatest differences with less than 1.0 difference in the comparison of means for farm and non-farm students in the total sample and the female sample.

For the suburban sample, significant differences in self-efficacy expectations were found for the comparison in the total sample where the mother was professional versus non-professional and between males and females. The comparison of mothers' professional-nonprofessional status proves nonsignificant for the female sample. An interesting finding was that the female sample was the only comparison to prove nonsignificant on this variable. Based on self-efficacy theory, role modeling should contribute highly to self-efficacy expectations. In the study of the suburban sample, mothers' professional-nonprofessional status was identified for that reason.

The urban sampling analysis resulted in conclusions which were completely contradictory to the anticipated results. While all three comparisons proved significant, the races described as "Other" appeared the most self-efficacious followed by the black sample and finally the white sample in both the total sample and in the female sample. The only explanation might be that, considering that self-efficacy was

measured by occupation desired minus occupation expected, the two minority groups had more realistic expectations for occupational attainment in relation to aspirations.

All four comparisons in the traditional family sample proved significant at the .05 level for the total sample. This indicated that there are significant differences in self-efficacy expectations among the four groups, as well as between traditional males and females. Within the female sample, the only nonsignificant difference was established between families where one parent was considered a professional as opposed to both parents being professionals. Rankings, however, were consistent with students who came from families where both parents were professional as the most self-efficacious, followed by students who had at least one professional parent and then students who came from families where neither parent was a professional.

The dual career family sample resulted in the same relative rankings except that self-efficacy expectations in a comparison of means were slightly higher than in the traditional family group. This would lend some credence to the assumption that students from dual career families are more self-efficacious than those from traditional family situations. Of interest was the difference in means for traditional males (2.7872) and dual career males (2.7254) compared with traditional females (5.3470) compared with dual career females (4.6042). While the male mean for both groups remained stable, the mean for dual career females decreased. The implication is that self-efficacy expectations for females from dual career families is greater than those from traditional family situations.

In the single family sample, none of the comparisons proved significant. The largest mean differences occurred in (1) the total sample for mother professional (3.5804) and mother non-professional (6.8578); the total sample of males (4.9217) versus females (6.6207); and the female sample of fathers engaged in professional occupations (5.3929) and of mothers engaged in non-professional occupations (8.3035).

An attempt was made to identify the performance goals and condition variables measured by the EQA Inventory in order to formulate an equation to predict self-efficacy expectations. Through multiple regression techniques, it was found that six of the eight variables included in the equation significantly loaded a prediction of self-efficacy. In decreasing order of significance those variables were (1) career awareness, parental occupation and educational expectations (0.0001 level of significance), (2) teacher expectations (0.0024 level of significance), (3) self-esteem (0.0321 level of significance), and (4) parental education (0.0088 level of significance). Nonsignificant variables were creative opportunity and parental expectations.

Even though six of the variables were significant, a step-wise regression suggested that contributions of the variables according to the equation was not adequate to justify the use of the formula to predict self-efficacy expectations. More positive results might have produced more validity in the use of the equation to predict self-efficacy in relation to career aspirations of high school students.

Conclusions

Since significant differences in self-efficacy were found among the major groups and subgroups of the study, it appears that self-efficacy theory, as proposed by Bandura (1977a), can be used as a possible factor in career aspirations of students from different socio-economic environments and parental occupational statuses as well as for differences in career aspirations of males and females. Bandura's (1978a) conceptualization of reciprocity between the cognitive self, environment, and behavior appears to affect levels of self-efficacy as related to career aspirations. It also appears that an instrument such as the Educational Quality Assessment Inventory, which provides a comparison between occupational desire and occupational expectation, can be used as a proxy measure of self-efficacy expectations of students. These students can then be grouped by areas of interest for research.

The study indicates that there are differences in self-efficacy expectations (the belief in the possibility of attaining desired occupational goals) between the major groups and subgroups. Differences were found in the total sample, in men versus women, and in the female sample. From the analyses of the data the following conclusions can be drawn:

1. It is concluded that place or locus of residence affects levels of self-efficacy expectations. Students who live in suburban environments exhibit higher levels of self-efficacy expectations than those from either urban or rural environments. Rural students exhibit the lowest levels of self-efficacy in relation to career aspirations,

although there is little difference between those living on a farm and those in a non-farm community. This would agree with Miller's (1983) conclusion that environmental circumstances are major determiners of vocational decisions and also Miller and Form's (1964) conclusion that chance seems to affect choices more than any other factor. Further support for the conclusion is provided by Kohr (1982) who found consistent differences in EQA data between rural, suburban, and urban schools in terms of performance on both performance goals and condition variables and also by Cosby and Picou (1972) who found that urban youth experience lower levels of perceived goal blockage than rural youth. They also found that significant differences exist between rural and urban females in the high aspiration and expectation categories.

2. It is concluded that parental occupational conditions affect the self-efficacy of the student. Students from families where both parents work outside of the home (dual career) are more self-efficacious than those from either traditional or single parent families although the difference between students from dual career and traditional family situations is small. The modeling of suburban mothers has an impact on students' self-efficacy perceptions. Bandura (1982) concludes that people learn through everyday experiences and through the specific persons with whom they interact. Modeling and vicarious experience are one of the four sources of self-efficacy identified by Bandura (1977a) who contends that expectations are derived from seeing others perform. Filsinger and Anderson (1982) also conclude that it is the social status of significant others from which the adolescent achieves a sense of social status. Jersild, Brook and Brook (1978) focused on

socialization and modeling practices of familial antecedents of adolescent development while Schaefer (1965) viewed socializing dimensions as consisting of childrearing practices and conscious identification of the child with his or her parents. In support of the conclusion, Stolte (1978) showed that the feedback a person obtains as a result of social situational interactions affects self-efficacy perceptions. This would support the conclusion that students from different parental occupational situations would differ in self-efficacy expectations.

3. It is concluded that sex of youth is related to self-efficacy. Female students consistently exhibit lower levels of self-efficacy than males. Hackett and Betz (1981) found differences in self-efficacy between college males and females. Kerr (1983) found that girls, seeing a conflict between family and career, may decide against occupations requiring personal commitment even though it may lead to higher status and salary. Significant differences between males and females in self-concept, vocational maturity, and occupational goals were also found by Utairat (1980), Tobias and Weissbrod (1980), and Wheeler (1983). These studies support the conclusion that females are generally less self-efficacious than males.

4. It is concluded that race affects perceived expectations of self-efficacy. Students who are categorized as either black or "other" are more self-efficacious than white students. It is possible that the black and "other" students are more self-efficacious as a result of desiring occupations for which they feel that their expectations of attainment are reasonable. Supporting the conclusion, Brown, Fulkerson,

Vedder and Ware (1983) found that black students are not as advanced as white students on measures of career development because of significant differences between black and white students' abilities to self-estimate. Lawrence and Brown (1976) and Pound (1978) found that black students scored lower on measures of career maturity than did white students. In addition, Cosby and Charner (1978) found race differences in career and career-related preferences of youth with blacks finding it harder to transmit advantages achieved at any stage to the next phase. This is further support for the conclusion that race affects self-efficacy perceptions.

5. It is concluded that self-esteem, creative opportunity, parental education, parental occupation, educational expectations of the student, teacher expectations, and career awareness contribute to self-efficacy expectations of youth. The factors would relate to Bandura's (1977a) identification of sources for self-efficacy, i.e., performance accomplishment, vicarious experience, verbal persuasion, and emotional arousal, thus supporting the hypothesis of the study and the conclusion.

Recommendations

The results of the study indicate that Bandura's social learning theory of self-efficacy is applicable to the study of vocational behavior. Therefore, a primary recommendation would be that parents and educators seek ways to expose students to the four sources which Bandura (1977a) identifies as contributing to greater self-efficacy expectations--performance accomplishment, vicarious experiences, verbal

persuasion, and emotional arousal--in an effort to encourage students to reach their highest potentials for vocational development.

The results of the study also indicate that Hackett and Betz's (1981) advocacy of self-efficacy theory in the understanding of female vocational behavior compared to that of males is a valid consideration for occupational choice. Kerr's (1983) finding that girls raised their career aspirations from pretest to posttest is evidence that career guidance can change girls' attitudes toward vocations. A second recommendation would be that the concepts of the theory be incorporated into the career counseling and career development activities for females.

Because research on self-efficacy theory has been limited, a third recommendation would be that educators in general and vocational educators in particular should devote more energies to research necessary to clearly ascertain the contribution of self-efficacy expectations to career decision making. McNair and Brown (1983) have recommended that "researchers may want to move from looking at global constructs such as career maturity and self-concept to Bandura's (1982) construct of self-efficacy as it relates to specific areas of career aspirations and expectations" (p. 35).

More specific to the study, a fourth recommendation would be to explore a more valid formula to be used to predict self-efficacy. The analyses provided by the study indicated that, while many of the variables included in the regression equation loaded significantly onto the self-efficacy measurement, the equation itself was not an accurate predictor of self-efficacy expectations. Perhaps a different

regression analysis could be performed using other variables included in the EQA. If the EQA Inventory could be utilized to predict self-efficacy expectations from a developmental standpoint using administrations at the 5th and 8th grade levels, intervention strategies might be developed to increase and strengthen self-efficacy expectations in relation to students' career development.

A fifth recommendation for study would be to track the students involved in the 1981 EQA Inventory over time. Such a longitudinal study would reveal changes in self-efficacy expectations as a result of maturity and experience. If a study of the same students, due to logistics, were not possible, a valuable comparison would be of students who will be 5 to 10 years removed from the sample used in the study. Self-efficacy expectations may prove quite different as society progresses toward acceptance of females in the working world and particularly in more professionally oriented positions.

A sixth recommendation would be to explore the data on single family units, the only sample to show no significance in self-efficacy expectations. Possibly due to small sample sizes, the results, nonetheless, indicate that the single parent family analysis provides results contradictory to the assumptions of the study because there were no significant differences found. A further analysis of that population sample might prove beneficial.

A seventh recommendation would be to investigate the influence of the mothers' occupational status and educational status of rural and urban groups to determine the maternal influence on career aspirations of youth.

An eighth recommendation would be to further investigate the mothers categorized as housewife. Particularly in the rural sample, the occupation of housewife may be more accurately considered as dual career, because of the varying nature of responsibilities posed to farm wives as opposed to traditional homemakers.

A final recommendation would be the comparison between urban whites, blacks and other races which resulted in a surprising comparison of levels of self-efficacy expectations. Again, contradictory to the assumptions of the study, the students reporting a race of "other" were the most self-efficacious with whites being the least self-efficacious. Because of the finding of Brown et al. (1983), a closer examination of the urban population might be important to ascertaining levels of self-efficacy expectations which may be more a result of differences in ability to self-estimate than in differences in self-efficacy. Because level of career aspiration was not addressed, the finding should be interpreted with caution and should prompt further research.

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APPENDIX A

COMPARISONS OF OCCUPATIONAL DESIRE AND OCCUPATIONAL EXPECTATIONS (BASED UPON ACTUAL AND WEIGHTED OCCUPATIONAL CODES BY FREQUENCIES AND RANKINGS)

Table 34

A Comparison of Occupational Desire and Occupational Expectations Based Upon Actual Occupational Codes by Frequency

Occupation	Occ. Desire	Occ. Expect	Differ-ential
HEALTH SERVICES			
001 Physician, Medical or Osteopathic	1,023	778	245
002 Dentist, Optometrist or Podiatrist	232	159	73
003 Veterinarian	525	287	283
004 Chiropractor	49	41	8
005 Pharmacist	225	182	43
006 Therapist	647	541	106
007 Medical or Dental Technician	443	518	-75
008 Registered Nurse	1,076	1,072	4
009 Optician, Lens Grinder or Polisher	18	17	1
010 Dietitian	92	85	7
011 Practical Nurse	332	317	15
012 Dental Assistant	228	213	15
013 Hospital Attendant or Nursing Aide	254	250	4

Occupation	Occ. Desire	Occ. Expect	Differ-ential
EDUCATION			
014 Administrator or Professor	62	59	3
015 Teacher or Guidance Counselor	897	886	11
016 Librarian or Curator	21	17	4
017 Recreation Worker	156	156	0
018 Library Assistant or Teacher Aide	26	31	-5
INDUSTRY - FACTORY			
019 Manager, Owner or Official	151	139	12
020 Research Technician	48	46	2
021 Tool and Die Maker	107	104	3
022 Industrial Supervisor	37	43	-6
023 Stationary Engineer	28	32	-4
024 Machinist or Millwright	267	307	-40
025 Metal Worker	97	120	-23
026 Welder or Flame-Cutter	332	308	24
027 Crane, Derrick, or Hoist Operator	15	17	-2
028 Furnace Tender, Smelter or Pourer	3	9	-6
029 Miner or Quarry Worker	29	51	-22

Occupation	Occ. Desire	Occ. Expect	Differ-ential
030 Assembler	20	52	-32
031 Fork Lift or Tow Motor Operator	34	32	2
032 Operator of Industrial Equipment	36	50	-14
033 Packer, Wrapper or Grader	9	50	-41
034 Textile Operative	22	32	-10
035 Industrial Laborer	72	234	-162
CONSTRUCTION			
036 Architect	732	521	211
037 Manager, Owner or Official	55	67	-12
038 Electrician	493	479	14
039 Construction Foreperson	80	82	-2
040 Plumber or Pipe Fitter	147	137	10
041 Structural Metal Worker	35	36	-1
042 Glazier	7	3	4
043 Dry Wall Installer or Lather	17	19	-2
044 Floor Layer	14	17	-3
045 Brick or Stone Mason	184	193	-9
046 Carpenter, Cabinetmaker or Plasterer	638	598	40
047 Heavy Equipment Operator	249	204	45
048 Paperhanger	12	11	1

Occupation	Occ. Desire	Occ. Expect	Differ-ential
049 Cement and Concrete Finisher	33	29	4
050 Roofer or Painter	64	70	-6
051 Construction Laborer	174	272	-98
052 Timber Cutting or Logging Worker	92	77	15
TRANSPORTATION			
053 Pilot	671	369	302
054 Manager, Owner or Official	39	34	5
055 Transportation Supervisor	23	17	6
056 Tranportation Agent	58	70	-12
057 Flight Attendant	522	320	202
058 Railroad Equipment Operator	33	29	4
059 Inspector of Vehicles	18	22	-4
060 Dispatcher	6	8	-2
061 Shipping or Receiving Clerk	11	13	-2
062 Deliveryperson	13	24	-11
063 Mechanic	1,076	1,028	48
064 Truck Driver	625	539	86
065 Bus Driver	24	32	-8
066 Taxi Driver	19	26	-7
067 Transportation Laborer	12	12	0

Occupation	Occ. Desire	Occ. Expect	Differ-ential
COMMUNICATION OR PUBLIC UTILITY			
068 Manager, Owner or Official	103	108	-5
069 Editor, Reporter or Writer	412	369	43
070 Technician	169	165	4
071 Postal Official	19	19	0
072 Supervisor	22	29	-7
073 Lineperson or Serviceperson	19	17	-2
074 Actor or Announcer	574	362	212
075 Meter Reader	12	12	0
076 Telephone Operator	34	27	7
077 Laborer	34	159	125
SERVICE WORKERS			
078 Police Officer or Detective	558	446	112
079 Fire Fighter	138	108	30
080 Appliance or Office Machine Repairer	42	44	-2
081 Printing Craftsworker	80	78	-2
082 Heating or Refrigeration Repairer	36	40	-4
083 Butcher or Meat Cutter	42	42	0

Occupation	Occ. Desire	Occ. Expect	Differ-ential
084 Decorator or Window Dresser	149	105	-6
085 Security Guard	25	27	-2
086 Bartender	187	148	39
087 Member of Armed Forces	413	634	-221
088 Barber or Beautician	852	819	33
089 Baker	57	60	-3
090 Tailor	27	25	2
091 Service Station Attendant	24	46	-22
092 Sanitation Worker	17	25	-8
093 Waiter or Waitress	122	296	-174
094 Janitor or Cleaner	35	66	-31
095 Cook	242	238	4
ENVIRONMENTAL SERVICES			
096 Farm Management Advisor	42	32	10
097 Forester or Conservationist	753	495	258
098 Home Management Advisor	8	11	-3
099 Farm Manager	54	69	-15
100 Farmer	401	416	-15
101 Farm Laborer	46	83	-37

Occupation	Occ. Desire	Occ. Expect	Differ-ential
CLERICAL WORKER			
102 Office manager or Supervisor	234	185	49
103 Mail Carrier or Clerk	22	26	-4
104 Bill or Account Collector	44	35	9
105 Stenographer or Secretary	1,434	1,714	-280
106 Bookkeeper	310	333	-23
107 Bank Teller	129	153	-24
108 Office Machine Operator or Typist	707	647	60
109 Office Clerk	174	266	-92
110 Messenger	9	16	-7
SALES WORKERS			
111 Stock Broker	108	106	2
112 Industrial Salesperson	42	54	-12
113 Advertising Agent or Salesperson	185	217	-32
114 Insurance Agent	43	51	-8
115 Real Estate Agent	96	125	-29
116 Wholesale or Retail Salesperson	87	118	-31
117 Services or Construction Salesperson	7	16	-9

Occupation	Occ. Desire	Occ. Expect	Differ-ential
118 Retail Sales Clerk or Cashier	117	307	-190
BUSINESS-OTHER THAN SALES			
119 Computer Specialist	1,580	1,521	59
120 Personnel or Labor Relations Worker	72	93	-21
121 Accountant or Auditor	1,131	1,119	12
122 Buyer or Purchasing Agent	176	174	2
123 Credit Worker	81	92	-11
Manager, Owner or Official			
124 of an Insurance or Real Estate Agency	56	68	-12
125 of a Bank or Finance Institution	102	103	-1
126 of a Government Office	68	68	0
127 of a Wholesale Trade	59	58	1
128 of a Furniture or Appliance Store	19	23	-4
129 of a Hardware, Implement or Building Supplier	14	26	-12
130 of a Motor Vehicles Dealership	48	35	13
131 of a Clothing Store	205	223	-18
132 of a Repair Service	52	59	-7
133 of a Food Store	94	137	-43

Occupation	Occ. Desire	Occ. Expect	Differ-ential
134 of a Service Station	22	27	-5
135 of a Motel, Bar or Restaurant	331	331	0
136 of a Personal Service	109	129	-20
OTHER PROFESSIONAL AND TECHNICAL WORKERS			
137 Lawyer or Judge	998	752	246
138 Life or Physical Scientist	321	290	31
139 Social Scientist	134	129	5
140 Engineer	1,544	1,562	-18
141 Mathematical Specialist	151	152	-1
142 Funeral Director	70	78	-8
143 Social Worker	520	500	20
144 Draftsperson or Artist	769	722	47
145 Clergyperson	64	65	-1
146 Photographer	577	381	196
147 Surveyor	28	39	-11
148 Musician	928	546	382
SPECIAL CATEGORY			
200 HOUSEWIFE	290	962	-672

Table 35

Ranking of Positive and Negative Differentials
Between Occupation Desired and Occupational Expectation
Based on Frequency

Positive Differentials

Occupation	Differential
Musician	382
Pilot	302
Veterinarian	283
Forester or Conservationist	258
Lawyer or Judge	246
Physician	245
Actor or Announcer	212
Architect	211
Flight Attendant	202
Photographer	196
Laborer	125
Police Officer or Detective	112
Therapist	106
Truck Driver	86
Dentist	73
Office Machine Operator or Typist	60
Computer Specialist	59

Occupation	Differential
Office Manager or Supervisor	49
Mechanic	48
Draftsperson or Artist	47
Heavy Equipment Operator	45
Pharmacist	43
Editor, Reporter or Writer	43
Carpenter, Cabinetmaker or Plasterer	40
Bartender	39
Barber or Beautician	33
Life or Physical Scientist	31
Fire Fighter	30
Welder or Flame-Cutter	24
Social Worker	20
Practical Nurse	15
Dental Assistant	15
Timber Cutting or Logging Working	15
Electrician	14
Manager/Owner of Motor Vehicles Dealership	13
Industry or Factory Manager Owner or Official	12
Accountant or Auditor	12
Teacher or Guidance Counselor	11
Plumber or Pipe Fitter	10

Occupation	Differential
Farm Management Advisor	10
Bill or Account Collector	9
Chiropractor	8
Dietitian	7
Telephone Operator	7
Transportation Supervisor	6
Social Scientist	5
Transportation Manager, Owner or Official	5
Registered Nurse	4
Hospital Attendant or Nursing Aide	4
Librarian or Curator	4
Glazier	4
Cement & Concrete Finisher	4
Railroad Equipment Operator	4
Public Utility Technician	4
Cook	4
Educational Administrator or Professor	3
Tool and Die Maker	3
Research Technician	2
Fork Lift or Tow Motor Operator	2
Buyer or Purchasing Agent	2
Tailor	2

Occupation	Differential
Stock Broker	2
Optician	1
Paperhanger	1
Manager of Wholesale Trade	1
Recreation Worker	0
Transportation Laborer	0
Postal Official	0
Meter Reader	0
Butcher or Meat Cutter	0
Official of a Government Office	0
Manager/Owner of Motel, Bar or Restaurant	0

Negative Differentials

Occupation	Differential
Housewife	-672
Stenographer or Secretary	-281
Member of Armed Forces	-221
Retail Sales Clerk or Cashier	-190
Waiter or Waitress	-174
Industrial Laborer	-162
Construction Laborer	-98

Occupation	Differential
Office Clerk	-92
Medical or Dental Technician	-75
Manager/Owner of a Food Store	-43
Packer, Wrapper or Grader	-41
Machinist or Millwright	-40
Farm Laborer	-37
Assembler	-32
Advertising Agent or Salesperson	-32
Janitor or Cleaner	-31
Wholesale or Retail Salesperson	-31
Real Estate Agent	-29
Bank Teller	-24
Metal Worker	-23
Bookkeeper	-23
Miner or Quarry Worker	-22
Service Station Attendant	-22
Personnel or Labor Relations Worker	-21
Manager/Owner of Personal Service	-20
Manager/Owner of a Clothing Store	-18
Engineer	-18
Farm Manager	-15
Farmer	-15

Occupation	Differential
Operator of Industrial Equipment	-14
Construction Manager or Owner	-12
Transportation Agent	-12
Industrial Spokeperson	-12
Manager/Owner of a Insurance or Real Estate Agency	-12
Manager/Owner of a Hardware, Implement or Building Supplier	-12
Deliveryperson	-11
Credit Worker	-11
Surveyor	-11
Textile Operative	-10
Brick or Stone Mason	-9
Services or Construction Salesperson	-9
Bus Driver	-8
Sanitation Worker	-8
Insurance Agent	-8
Funeral Director	-8
Taxi Driver	-7
Communication or Public Utility Supervisor	-7
Messenger	-7
Manager/Owner of a Repair Service	-7
Industrial Supervisor	-6

Occupation	Differential
Furnace Tender, Smelter or Pourer	-6
Roofer or Painter	-6
Decorator or Window Dresser	-6
Library Assistant or Teacher Aide	-5
Communication or Public Utility Manager or Owner	-5
Manager/Owner of a Service Station	-5
Stationary Engineer	-4
Inspector of Vehicles	-4
Heating or Refrigeration Repairer	-4
Mail Carrier or Clerk	-4
Manager/Owner of Furniture or Appliance Store	-4
Floor Layer	-3
Baker	-3
Home Management Advisor	-3
Crane, Derrick or Hoist Operator	-2
Construction Foreperson	-2
Dry Wall Installer or Lather	-2
Dispatcher	-2
Shipping or Recovery Clerk	-2
Lineperson or Supervisor	-2

Occupation	Differential
Appliance or Office Machine Repairer	-2
Printing Craftsworker	-2
Security Guard	-2
Structural Metal Worker	-1
Manager/Owner/Official of a Bank Financial Institution	-1
Mathematical Specialist	-1
Clergyperson	-1

Table 36

A Comparison of Occupational Desire and Occupational Expectation Based Upon Weighted Occupational Codes by Frequency

Weighting	Occ Desire	Occ Expect	Differ-ential
99	2,778	1,976	802
97	732	521	211
96	517	478	39
95	157	147	10
94	2,482	2,145	337
92	358	359	-1
91	1,580	1,521	59
90	102	103	-1
89	1,203	1,212	-9
88	272	288	-16
86	688	683	5
85	109	112	-3
84	42	40	2
83	897	886	11
82	534	526	8
81	238	310	-72
80	1,308	1,208	100
79	169	165	4
78	772	514	258
77	857	774	83

Weighting	Occ Desire	Occ Expect	Differ-ential
75	650	457	193
74	196	178	18
73	754	645	109
72	47	56	-9
71	574	362	212
70	646	685	-39
69	597	393	204
68	443	518	-75
67	7	16	-9
66	1,094	1,094	0
64	28	32	-4
63	86	86	0
62	494	526	-32
61	133	128	5
58	156	156	0
57	1,456	1,741	-285
56	442	431	11
54	42	42	0
53	109	129	-20
52	461	522	-61
51	17	19	-2
50	11	13	-2
49	1,389	1,007	382

Weighting	Occ Desire	Occ Expect	Differ-ential
48	27	41	-14
47	1,076	1,028	48
46	1,055	962	93
44	392	375	17
43	28	36	-8
42	1,267	1,431	-164
41	1,047	1,070	-23
40	1,235	1,055	70
39	12	11	1
37	34	32	2
35	19	26	-7
34	57	60	-3
32	250	456	-206
31	401	416	-15
28	302	303	-1
25	34	159	-125
24	207	346	-139
22	17	25	-8
20	94	266	-172
19	157	362	-205
15	46	83	-37

Weighting	Occ Desire	Occ Expect	Differ-ential
14	242	238	4
12	92	77	15
1	290	962	-672
	Total 33,898	Total 33,024	
	Mean 69.0327	Mean 65.1181	
	SD 22.9822	SD 25.2574	

Table 37

Ranking of Positive and Negative Differentials between Weighted Occupational Desire and Occupational Expectations Based on Frequencies

Positive Differentials

Weighting	Differential
99	802
49	382
94	337
78	258
71	212
97	211
69	204
75	193
73	109
80	100
46	93
77	83
40	70
91	59
47	48
96	39
74	18
44	17

Weighting	Differential
12	15
83	11
56	11
95	10
82	8
86	5
61	5
79	4
14	4
84	2
37	2
39	1
66	0
63	0
58	0
54	0

Negative Differentials

Weighting	Differential
1	-672
57	-285
32	-206

Weighting	Differential
19	-205
20	-172
42	-164
24	-139
25	-125
68	-75
81	-72
52	-61
70	-39
15	-37
62	-32
41	-23
53	-20
88	-16
31	-15
48	-14
89	-9
72	-9
67	-9
43	-8
22	-8
35	-7
64	-4

Weighting	Differential
85	-3
34	-3
51	-2
50	-2
92	-1
90	-1
28	-1

APPENDIX B

EQA WEIGHTINGS OF OCCUPATIONAL CODES

Table 38

Weighting of Occupational Codes by Clusters

Occupation	Weighting
HEALTH SERVICES	
001 Physician, Medical or Osteopathic	99
002 Dentist, Optometrist or Podiatrist	99
003 Veterinarian	99
004 Chiropractor	95
005 Pharmacist	94
006 Therapist	73
007 Medical or Dental Technician	68
008 Registered Nurse	66
009 Optician, Lens Grinder or Polisher	61
010 Dietitian	56
011 Practical Nurse	44
012 Dental Assistant	41
013 Hospital Attendant or Nursing Aide	28
EDUCATION	
014 Administrator or Professor	96
015 Teacher or Guidance Counselor	83
016 Librarian or Curator	75
017 Recreation Worker	58
018 Library Assistant or Teacher Aide	44

Occupation	Weighting
INDUSTRY - FACTORY	
019 Manager, Owner or Official	92
020 Research Technician	86
021 Tool and Die Maker	73
022 Industrial Supervisor	70
023 Stationary Engineer	64
024 Machinist or Millwright	62
025 Metal Worker	52
026 Welder or Flame-Cutter	49
027 Crane, Derrick, or Hoist Operator	46
028 Furnace Tender, Smelter, or Pourer	43
029 Miner or Quarry Worker	42
030 Assembler	41
031 Fork Lift or Tow Motor Operator	37
032 Operator of Industrial Equipment	32
033 Packer, Wrapper or Grader	24
034 Textile Operative	20
035 Industrial Laborer	20
CONSTRUCTION	
036 Architect	97
037 Manager, Owner or Official	81
038 Electrician	70

Occupation	Weighting
039 Construction Foreperson	62
040 Plumber or Pipe Fitter	62
041 Structural Metal Worker	61
042 Glazier	56
043 Dry Wall Installer or Lather	51
044 Floor Layer	48
045 Brick or Stone Mason	46
046 Carpenter, Cabinetmaker or Plasterer	42
047 Heavy Equipment Operator	40
048 Paperhanger	39
049 Cement and Concrete Finisher	32
050 Roofer or Painter	32
051 Construction Laborer	24
052 Timber Cutting or Logging Worker	12
TRANSPORTATION	
053 Pilot	94
054 Manager, Owner or Official	85
055 Transportation Supervisor	84
056 Transportation Agent	74
057 Flight Attendant	69
058 Railroad Equipment Operator	69
059 Inspector of Vehicles	66
060 Dispatcher	63

Occupation	Weighting
061 Shipping or Receiving Clerk	50
062 Deliveryperson	48
063 Mechanic	47
064 Truck Driver	41
065 Bus Driver	40
066 Taxi Driver	35
067 Transportation Laborer	28
COMMUNICATION OR PUBLIC UTILITY	
068 Manager, Owner or Official	88
069 Editor, Reporter or Writer	86
070 Technician	79
071 Postal Official	78
072 Supervisor	77
073 Lineperson or Serviceperson	72
074 Actor or Announcer	71
075 Meter Reader	56
076 Telephone Operator	44
077 Laborer	25
SERVICE WORKERS	
078 Police Officer or Detective	77
079 Fire Fighter	74
080 Appliance or Office Machine Repairer	69

Occupation	Weighting
081 Printing Craftsworker	63
082 Heating or Refrigeration Repairer	61
083 Butcher or Meat Cutter	54
084 Decorator or Window Dresser	46
085 Security Guard	43
086 Bartender	42
087 Member of Armed Forces	42
088 Barber or Beautician	40
089 Baker	34
090 Tailor	28
091 Service Station Attendant	24
092 Sanitation Worker	22
093 Waiter or Waitress	19
094 Janitor or Cleaner	19
095 Cook	14
ENVIRONMENTAL SERVICES	
096 Farm Management Advisor	94
097 Forester or Conservationist	78
098 Home Management Advisor	77
099 Farm Manager	52
100 Farmer	31
101 Farm Laborer	15

Occupation	Weighting
CLERICAL WORKERS	
102 Office Manager or Supervisor	80
103 Mail Carrier or Clerk	70
104 Bill or Account Collector	61
105 Stenographer or Secretary	57
106 Bookkeeper	52
107 Bank Teller	49
108 Office Machine Operator or Typist	46
109 Office Clerk	41
110 Messenger	28
SALES WORKERS	
111 Stock Broker	95
112 Industrial Salesperson	88
113 Advertising Agent or Salesperson	86
114 Insurance Agent	86
115 Real Estate Agent	81
116 Wholesale or Retail Salesperson	81
117 Services or Construction Salesperson	67
118 Retail Sales Clerk or Cashier	32

Occupation	Weighting
BUSINESS-OTHER THAN SALES	
119 Computer Specialist	91
120 Personnel or Labor Relations Worker	89
121 Accountant or Auditor	89
122 Buyer or Purchasing Agent	80
123 Credit Worker	80
Manager, Owner or Official	
124 of an Insurance or Real Estate Agency	92
125 of a Bank or Finance Institution	90
126 of a Government Office	88
127 of a Wholesale Trade	88
128 of a Furniture or Appliance Store	84
129 of a Hardware, Implement or Building Supplier	82
130 of a Motor Vehicles Dealership	80
131 of a Clothing Store	77
132 of a Repair Service	75
133 of a Food Store	70
134 of a Service Station	57
135 of a Motel, Bar or Restaurant	56
136 of a Personal Service	53

Occupation	Weighting
OTHER PROFESSIONAL AND TECHNICAL WORKERS	
137 Lawyer or Judge	99
138 Life or Physical Scientist	96
139 Social Scientist	96
140 Engineer	94
141 Mathematical Specialist	92
142 Funeral Director	85
143 Social Worker	82
144 Draftsperson or Artist	80
145 Clergyperson	77
146 Photographer	75
147 Surveyor	72
148 Musician	49

Table 39

Ranking of Occupational Code Weightings

Occupation	Weighting
Physician, Medical or Osteopathic	99
Dentist, Optometrist or Podiatrist	99
Veterinarian	99
Lawyer or Judge	99
Architect	97
Education Administrator or Professor	96
Life or Physical Scientist	96
Social Scientist	96
Chiropractor	95
Stock Broker	95
Pharmacist	94
Pilot	94
Farm Management Advisor	94
Engineer	94
Industry/Factory Owner or Manager	92
Manager/Owner of an Insurance or Real Estate Agency	92
Mathematical Specialist	92
Computer Specialist	91
Manager/Owner of a Bank or Financial Institution	90
Personnel or Labor Relations Worker	89

Occupation	Weighting
Accountant or Auditor	89
Communication or Public Utility Manager/Owner/Official	88
Industrial Salesperson	88
Official of a Government Office	88
Manager/Owner of a Wholesale Trade	88
Research Technician	86
Editor, Reporter or Writer	86
Advertising Agent or Salesperson	86
Insurance Agent	86
Transportation Manager, Owner or Official	85
Funeral Director	85
Transportation Supervisor	84
Manager/Owner of a Furniture or Appliance Store	84
Teacher or Guidance Counselor	83
Manager/Owner of a Hardware, Implement or Building Supplier	82
Social Worker	82
Construction Manager, Owner or Official	81
Real Estate Agent	81
Wholesale or Retail Salesperson	81
Office Manager or Supervisor	80
Buyer or Purchasing Agent	80

Occupation	Weighting
Credit Worker	80
Manager/Owner of a Motor Vehicles Dealership	80
Draftsperson or Artist	80
Communication or Public Utility Technician	79
Postal Official	78
Forester or Conservationist	78
Communication or Public Utility Supervisor	77
Police Officer or Detective	77
Home Management Advisor	77
Manager/Owner of a Clothing Store	77
Clergyperson	77
Librarian or Curator	75
Manager/Owner of a Repair Service	75
Photographer	75
Transportation Agent	74
Fire Fighter	74
Therapist	73
Tool and Die Maker	73
Communication Lineperson or Serviceperson	72
Surveyor	72
Actor or Announcer	71
Industrial Supervisor	70

Occupation	Weighting
Electrician	70
Mail Carrier or Clerk	70
Manager/Owner of a Food Store	70
Flight Attendant	69
Railroad Equipment Operator	69
Appliance or Office Machine Repairer	69
Medical or Dental Technician	68
Services or Construction Salesperson	67
Registered Nurse	66
Inspector of Vehicles	66
Stationary Engineer	64
Dispatcher	63
Printing Craftsworker	63
Machinist Millwright	62
Construction Forceperson	62
Plumber or Pipe Fitter	62
Optician, Lens Grinder, or Polisher	61
Structural Metal Worker	61
Heating or Refrigeration Repairer	61
Bill or Account Collector	61
Recreation Worker	58
Stenographer or Secretary	57
Manager/Owner of a Service Station	57
Dietician	56

Occupation	Weighting
Glazier	56
Meter Reader	56
Manager/Owner of a Motel Bar or Restaurant	56
Butcher or Meat Cutter	54
Manager/Owner of a Personal Service	53
Metal Worker	52
Bookkeeper	52
Farm Manager	52
Dry Wall Installer or Lather	51
Shipping or Receiving Clerk	50
Welder or Flame-Cutter	49
Bank Teller	49
Musician	49
Floor Layer	48
Deliveryperson	48
Mechanics	47
Crane, Derrick, or Hoist Operator	46
Brick or Stone Mason	46
Decorator or Window Dresser	46
Office Machine Operator or Typist	46
Practical Nurse	44
Library Assistant or Teacher Aide	44
Telephone Operator	44

Occupation	Weighting
Furnace Tender, Smelter or Pourer	43
Security Guard	43
Miner or Quarry Worker	42
Carpenter, Cabinetmaker or Plasterer	42
Bartender	42
Member of Armed Forces	42
Dental Assistant	41
Assembler (Industry or Factory)	41
Truck Driver	41
Office Clerk	41
Heavy Equipment Operator	40
Bus Driver	40
Barber or Beautician	40
Paperhanger	39
Fork Lift or Tow Motor Operator	37
Taxi Driver	35
Baker	34
Operator of Industrial Equipment	32
Cement and Concrete Finisher	32
Roofer or Pa[illegible]er	32
Retail Sales Clerk or Cashier	32
Farmer	31
Hospital Attendant or Nursing Aide	28
Transportation Laborer	28

Occupation	Weighting
Tailor	28
Messenger	28
Laborer (Communications or Public Utility)	25
Packer, Wrapper or Grader	24
Construction Laborer	24
Service Station Attendant	24
Sanitation Worker	22
Textile Operative	20
Industrial Laborer	20
Waiter or Waitress	19
Janitor or Cleaner	19
Farm Laborer	15
Cook	14
Timber Cutting or Logging Worker	12
Housewife	

APPENDIX C

PARENTAL OCCUPATIONAL LEVELS BY FREQUENCIES AND WEIGHTINGS

Table 40

Fathers' Occupational Codes and Mothers' Occupational Codes by Frequency

Occupation	Father	Mother	Differential
HEALTH SERVICES			
001 Physician, Medical or Osteopathic	318	59	259
002 Dentist, Optometrist or Podiatrist	109	28	81
003 Veterinarian	54	24	30
004 Chiropractor	22	10	12
005 Pharmacist	103	44	59
006 Therapist	53	79	-26
007 Medical or Dental Technician	59	130	-71
008 Registered Nurse	19	1,070	-1,051
009 Optician, Lens Grinder or Polisher	18	16	2
010 Dietitian	12	116	-104
011 Practical Nurse	20	447	-427
012 Dental Assistant	17	101	-84
013 Hospital Attendant or Nursing Aide	70	718	-648

Occupation	Father	Mother	Differential
EDUCATION			
014 Administrator or Professor	419	105	314
015 Teacher or Guidance Counselor	655	1,008	-353
016 Librarian or Curator	9	80	-71
017 Recreation Worker	27	54	-27
018 Library Assistant or Teacher Aide	8	403	-395
INDUSTRY - FACTORY			
019 Manager, Owner or Official	984	76	908
020 Research Technician	165	31	134
021 Tool and Die Maker	326	26	300
022 Industrial Supervisor	952	81	871
023 Stationary Engineer	142	16	126
024 Machinist or Millwright	1291	216	1075
025 Metal Worker	622	38	584
026 Welder or Flame-Cutter	555	34	521
027 Crane, Derrick, or Hoist Operator	224	12	212
028 Furnace Tender, Smelter or Pourer	214	4	210
029 Miner or Quarry Worker	304	8	296
030 Assembler	263	431	-168

Occupation	Father	Mother	Differential
031 Fork Lift or Tow Motor Operator	242	32	210
032 Operator of Industrial Equipment	480	142	338
033 Packer, Wrapper or Grader	132	342	-210
034 Textile Operative	98	552	-454
035 Industrial Laborer	1096	490	606
CONSTRUCTION			
036 Architect	167	38	129
037 Manager, Owner or Official	340	15	325
038 Electrician	622	23	599
039 Construction Foreperson	417	7	410
040 Plumber or Pipe Fitter	281	9	272
041 Structural Metal Worker	106	4	102
042 Glazier	13	5	-4
043 Dry Wall Installer or Lather	44	7	37
044 Floor Layer	50	3	47
045 Brick or Stone Mason	190	22	168
046 Carpenter, Cabinetmaker or Plasterer	672	17	675
047 Heavy Equipment Operator	410	23	387
048 Paperhanger	27	5	22

Occupation	Father	Mother	Differential
049 Cement and Concrete Finisher	82	5	77
050 Roofer or Painter	192	12	180
051 Construction Laborer	421	15	406
052 Timber Cutting or Logging Worker	100	30	70
TRANSPORTATION			
053 Pilot	125	35	90
054 Manager, Owner or Official	186	17	169
055 Transportation Supervisor	132	8	124
056 Tranportation Agent	29	32	-3
057 Flight Attendant	11	15	-4
058 Railroad Equipment Operator	185	7	178
059 Inspector of Vehicles	40	6	34
060 Dispatcher	71	9	62
061 Shipping or Receiving Clerk	84	18	66
062 Deliveryperson	115	15	100
063 Mechanic	1458	54	1404
064 Truck Driver	1426	64	1362
065 Bus Driver	139	192	-53
066 Taxi Driver	28	10	18
067 Transportation Laborer	119	14	105

Occupation	Father	Mother	Differential
COMMUNICATION OR PUBLIC UTILITY			
068 Manager, Owner or Official	246	93	153
069 Editor, Reporter or Writer	57	40	17
070 Technician	221	26	195
071 Postal Official	177	60	117
072 Supervisor	298	99	199
073 Lineperson or Serviceperson	201	18	183
074 Actor or Announcer	19	11	8
075 Meter Reader	46	8	38
076 Telephone Operator	43	168	-125
077 Laborer	238	123	115
SERVICE WORKERS			
078 Police Officer or Detective	423	49	374
079 Fire Fighter	105	18	87
080 Appliance or Office Machine Repairer	92	6	86
081 Printing Craftsworker	139	18	121
082 Heating or Refrigeration Repairer	102	2	100
083 Butcher or Meat Cutter	130	51	79

Occupation	Father	Mother	Differential
084 Decorator or Window Dresser	10	24	-14
085 Security Guard	165	30	135
086 Bartender	88	112	-24
087 Member of Armed Forces	94	15	79
088 Barber or Beautician	111	293	-182
089 Baker	62	80	-18
090 Tailor	35	92	-57
091 Service Station Attendant	31	6	25
092 Sanitation Worker	87	19	68
093 Waiter or Waitress	15	554	-539
094 Janitor or Cleaner	273	357	-84
095 Cook	91	565	-474
ENVIRONMENTAL SERVICES			
096 Farm Management Advisor	29	6	23
097 Forester or Conservationist	84	29	55
098 Home Management Advisor	8	9	-1
099 Farm Manager	37	12	25
100 Farmer	468	58	410
101 Farm Laborer	32	26	6

Occupation	Father	Mother	Differential
CLERICAL WORKERS			
102 Office Manager or Supervisor	474	512	-38
103 Mail Carrier or Clerk	181	94	87
104 Bill or Account Collector	27	102	-75
105 Stenographer or Secretary	25	1,797	-1772
106 Bookkeeper	53	598	-545
107 Bank Teller	22	293	-271
108 Office Machine Operator or Typist	32	509	-477
109 Office Clerk	108	663	-555
110 Messenger	5	12	-7
SALES WORKERS			
111 Stock Broker	69	22	47
112 Industrial Salesperson	411	37	374
113 Advertising Agent or Salesperson	326	130	196
114 Insurance Agent	322	64	258
115 Real Estate Agent	126	215	-89
116 Wholesale or Retail Salesperson	511	228	283
117 Services or Construction Salesperson	143	27	116
118 Retail Sales Clerk or Cashier	82	892	-810

Occupation	Father	Mother	Differential
BUSINESS-OTHER THAN SALES			
119 Computer Specialist	505	150	355
120 Personal or Labor Relations Worker	131	79	52
121 Accountant or Auditor	525	200	325
122 Buyer or Purchasing Agent	209	61	148
123 Credit Worker	148	61	87
Manager, Owner or Official			
124 of an Insurance or Real Estate Agency	187	66	121
125 of a Bank or Finance Institution	165	75	90
126 of a Government Office	154	73	81
127 of a Wholesale Trade	169	53	116
128 of a Furniture or Appliance Store	80	26	54
129 of a Hardware, Implement or Building Supplier	88	19	69
130 of a Motor Vehicles Dealership	125	9	116
131 of a Clothing Store	61	191	-130
132 of a Repair Service	110	18	92
133 of a Food Store	243	230	13
134 of a Service Station	49	8	41
135 of a Motel, Bar or Restaurant	208	183	25

Occupation	Father	Mother	Differential
136 of a Personal Service	170	132	38
OTHER PROFESSIONAL AND TECHNICAL WORKERS			
137 Lawyer or Judge	238	44	194
138 Life or Physical Scientist	96	12	84
139 Social Scientist	22	5	17
140 Engineer	1,253	33	1220
141 Mathematical Specialist	31	7	24
142 Funeral Director	58	21	37
143 Social Worker	72	163	-91
144 Draftsperson or Artist	249	44	205
145 Clergyperson	191	18	173
146 Photographer	44	30	14
147 Surveyor	35	11	24
148 Musician	50	48	2
SPECIAL CATEGORIES			
200 Housewife	99	13,407	-13,308
300 Unemployed	776	1,080	-304
400 Pensioned	651	74	577
500 Student	25	187	-162
TOTAL	37,942	37,942	

APPENDIX D

PERMISSION FROM THE PENNSYLVANIA DEPARTMENT OF EDUCATION TO USE EQA MATERIALS

PENNSYLVANIA DEPARTMENT OF EDUCATION
333 MARKET STREET
P.O. BOX 911
HARRISBURG, PA 17108

May 8, 1984

Mrs. Donna J. Dentler
807 Charles Street
Mechanicsburg, PA 17055

Dear Mrs. Dentler:

I am responding to your request to include selected portions of the Manual for Interpreting Secondary School Reports and Getting Inside the EQA Inventory in the appendices of your doctoral dissertation. I understand this would help clarify the nature of the goal areas and condition variables used in your study. You are hereby granted permission to include such relevant information in your dissertation appendices along with appropriate statement referencing the source documents and stating that permission to use material was granted by the Pennsylvania Department of Education.

Best wishes in the successful completion of your study. We will be most interested in receiving a copy of your dissertation upon its completion.

Sincerely yours,

Richard F. Kohr

Dr. Richard L. Kohr
Research Associate
Division of Educational Testing
and Evaluation
Bureau of Educational Planning
and Testing
Telephone: (717) 787-4234

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APPENDIX E

NORMAL CURVE WITH Z-SCORES AND PERCENTILE EQUIVALENTS

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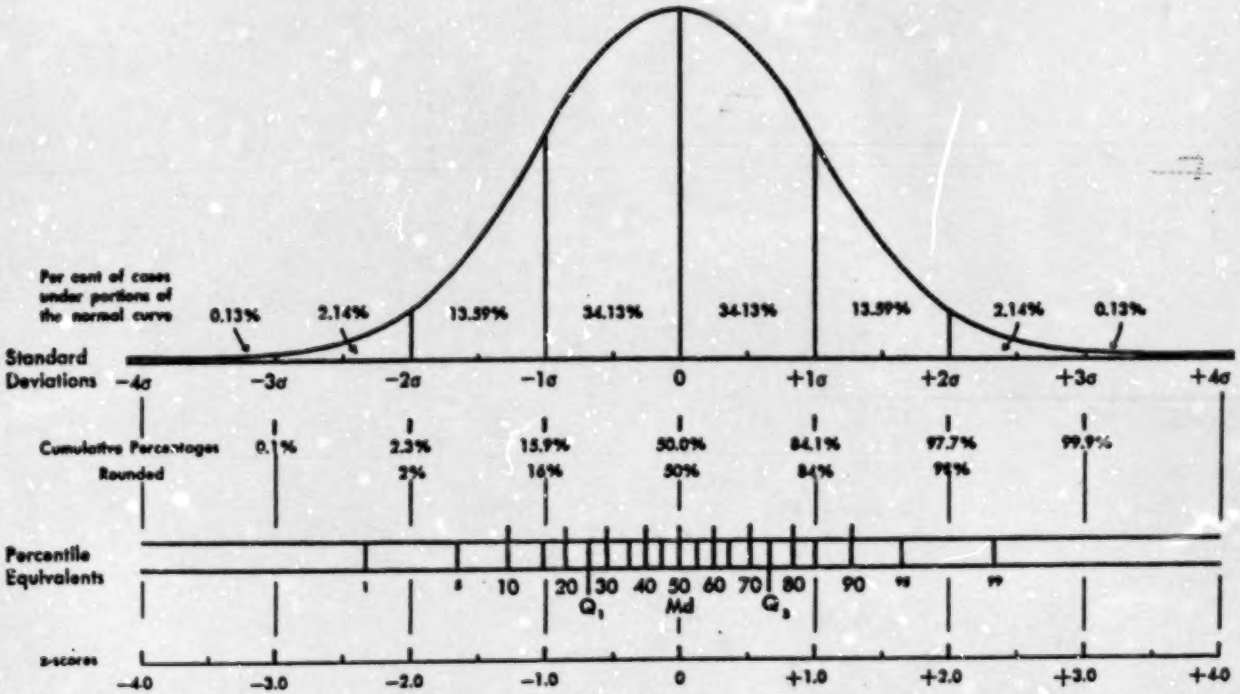

Figure 3. Normal Curve with Z-Scores and Percentile Equivalents

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VITA

Donna J. Dentler
800 Charles Street
Mechanicsburg, PA 17055
(717) 766-9266

Date of Birth: May 15, 1948
Marital Status: Married
Children: One

EDUCATION:

Ph. D. in Vocational Education, Minor in Psychology, The Pennsylvania State University, University Park, Pennsylvania, December 1984.
M. Ed. in Vocational Industrial Education, The Pennsylvania State University, University Park, Pennsylvania, May 1979.
Director of Vocational Education Certification, The Pennsylvania State University, University Park, Pennsylvania, May 1979.
Cooperative Education Certification, Temple University, Philadelphia, Pennsylvania, May 1977.
B. S. in Business Education, Indiana University of Pennsylvania, Indiana, Pennsylvania, May 1970.

EXPERIENCE:

Messiah College, Grantham, PA 17027, from July 1979 to present.
Director of Career Development and Cooperative Education. Responsible for total career development and cooperative education activities for this four-year liberal arts institution.

Northern York County School District, Dillsburg, PA 17019, from September 1974 to May 1979.
Director of Career Resource Center. Designed and implemented a Career Resource Center to accommodate the career education needs of the district and community. Directed a program to utilize funds for a cooperative education program for academically disadvantaged, economically disadvantaged, and physically handicapped students.
Business Education Cooperative Education Coordinator. Correlated in-school training with career-oriented on-the-job experiences.
Business Education Teacher.

Lydia Patterson Institute, El Paso, Texas, January 1972 to June 1973.
Business Education Teacher. Lydia Patterson is a private bilingual institution with a 95% Mexican student population.

Verona School District, Verona, Pennsylvania, September 1970 to January 1971.
Business Education Teacher.

APPENDIX F

SUMMARY OF EQA INSTRUMENTS

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SUMMARY OF INSTRUMENTS

AREA	SCALE DESCRIPTION	NO. OF ITEMS	SAMPLE ITEMS	RESPONSE CHOICES
SELF-ESTEEM	Students are asked to relate their feelings of success and feelings of acceptance – primarily in the school setting.	32 (8)	I am able to mix well with other people. My teachers listen to what I have to say. I am good at picking out the right things to study. My classmates think I have good ideas.	SA = Strongly Agree MA = Mostly Agree MD = Mostly Disagree SD = Strongly Disagree
UNDERSTANDING OTHERS	Students are asked to respond to approaches and interactions with persons of differing skin color, religious beliefs, physical characteristics, socio-economic status or cultural tradition.	40 (10)	Would you mind sitting in class beside a student who: Has few friends because of the way he or she looks? Is very much like you, but whose skin color is different from yours? Is much poorer than you? Belongs to a religion which you do not belong to? Is from another country and doesn't speak English very well?	A = Yes B = I think so C = I don't know D = I don't think so E = No
COMMUNICATION SKILLS: READING COMPREHENSION	*Literal comprehension* - recognition of details or the main ideas explicitly stated. *Word meaning* - recognition of the appropriate meaning of a word in a given context. *Inferential comprehension* - response to items which require taking the meaning of a passage beyond explicit ideas.	48 (12)	[A wide variety of reading materials was used to cover the many different styles, purposes and types of content in written matter the reader encounters in school and leisure]	[Four, multiple-choice options]
COMMUNICATION SKILLS: WRITING SKILLS	A. *Mechanics and usage* – recognizing the application of conventions. B. *Sentence sense* – recognizing clear, concise and effective sentences. C. *Paragraph sense* – recognizing coherence, unity and transition in the organization and development of paragraphs and larger units. D. *Style, tone and flavor* – recognizing effective and appropriate language for a given purpose, audience or situation.	60 (15)	Choose the sentence which best fits the blank. There is definitely too much violence in sports. In basketball, players are often elbowed or knocked to the floor. In football, the object of the game is to tackle the person carrying the ball. _____. Even in baseball, it is possible to see fights between the teams. Choose the best way of writing the part of the sentence underlined. Not far from shore, the oil tanker was caught on a reef. The stormy *weather however kept* the Coast Guard cutter from reaching the troubled ship.	A In soccer, someone kicked my ankle one time. B Fans sometimes fight with one another. C In hockey, fighting between players is common. D Football games are exciting and full of action. A weather however kept B weather, however kept C weather however, kept D weather, however, kept

AREA	SCALE DESCRIPTION	NO. OF ITEMS	SAMPLE ITEMS	RESPONSE CHOICES
MATHEMATICS	Items measure mathematical concepts, computation and/or problem-solving.	60 (15)	[Items include questions about: number systems, numeration and notation, geometry, measurements, number patterns and relationships, and other topics]	[Four, multiple-choice options]
INTEREST IN SCHOOL AND LEARNING	Students are to display their feelings on the climate and learning atmosphere in the school, the educational experiences the school provides, the quality of the personal interactions it fosters between student and educator, and the students' attitudes toward learning.	40 (10)	I like learning social studies in this school. Many of my school assignments are a waste of time. My teachers are interested in how well I do my assignments. There are interesting activities to look forward to in this school.	SA = Strongly Agree MA = Mostly Agree MD = Mostly Disagree SD = Strongly Disagree
SOCIETAL RESPONSIBILITY (Citizenship)	Students are asked if they will assume responsibility for their actions and the actions of groups to which they belong, work cooperatively, demonstrate integrity when dealing with others, and take the initiative and assume leadership, as well as support group efforts as followers.	36 (9)	A student gets a dog. A city law requires that a $10 dog tag be bought by the dog's owner. In this situation, I would BUY THE TAG... if the dog might be more easily lost or stolen without a tag. if the fine for not having a tag was $25. since owners are responsible for their dogs.	Y = Yes M = Maybe N = No
KNOWLEDGE OF LAW/GOVERNMENT (Citizenship)	Three major areas of knowledge were identified as essential to good citizenship. They are broadly described as knowledge of government, knowledge of law and knowledge of interdependence of people.	48 (12)	Case law comes from The North Atlantic Treaty Organization (NATO) was formed to improve Which is a right guaranteed to all United States citizens?	A previous court decisions. B constitutional principles. C local customs. D unwritten tradition. A health standards and practices in member nations. B scientific research for economic development in member nations. C military defenses of member nations. D trade among member nations. A to practice the religion of one's choice B to choose who can live in the house next door C to have a job D to try to overthrow the government

AREA	SCALE DESCRIPTION	NO. OF ITEMS	SAMPLE ITEMS	RESPONSE CHOICES
HEALTH AND SAFETY PRACTICES	Students are to demonstrate that they have acquired habits and attitudes which increase the probability of remaining healthy, safe and fit throughout life.	48 (12)	The school permits students to use the gym after school. I want to use the trampoline but nobody wants to stand around to catch me if I fall. I would USE THE TRAMPOLINE ANYWAY... if I had done it before and nothing had gone wrong. if I thought that I was pretty good on the trampoline. if I thought that the others in the gym would not tell on me.	A = Definitely Would B = Probably Would C = Probably Would Not D = Definitely Would Not
CREATIVE ACTIVITIES (Arts and Humanities and Science and Technology Items)	Students are asked to indicate frequency of participation in five areas: visual arts, performing arts, writing, science, and social and practical studies.	40 (10)	During the last three years, how many times have you done the following? Developed a new strategy or play for use in a sport? Created a sculpture? Written fiction such as a story or a scene from a play? Played a musical instrument in front of a class or a larger audience, using your own interpretation of the music?	A = Have not done the activity. B = Have done the activity once. C = Have done the activity 2 or 3 times. D = Have done the activity about 5 times. E = Have done the activity about 8 times (or more).
CAREER AWARENESS (Work)	The students are queried on their awareness of duties, training, abilities and educational requirements of various occupations, an understanding of the labor market conditions, and skills in gathering such data, such as knowledge of occupational clusters and publications.	40 (10)	The need to work with others as part of a team would be most important to a The job most likely to require a completed apprenticeship is a Unemployment rate is the highest in which age range? Today there is a great demand for, and a short supply of, women in	A psychiatrist. B movie editor. C writer. D fire fighter. A printer. B keypuncher. C chemical engineer. D landscaper. A 16-19 B 25-30 C 40-45 D 55-60 A law enforcement. B marine sciences. C consumer affairs. D retail sales.

AREA	SCALE DESCRIPTION	NO. OF ITEMS	SAMPLE ITEMS	RESPONSE CHOICES
APPRECIATING HUMAN ACCOMPLISHMENTS (Arts and Humanities and Science and Technology Items)	Student openness is displayed by a willingness to engage in listening, watching or reading activities relating to significant accomplishments In addition, the student reaching the higher levels of openness will display willingness to learn about accomplishments and what is entailed in producing them.	64 (16)	WOULD YOU WANT TO: See a world-famous play? Talk to officials to learn about your local government? Read stories written by authors from other parts of the world? Learn more about what makes a movie great?	A = Definitely Would B = Probably Would C = Uncertain D = Probably Would Not E = Definitely Would Not
KNOWLEDGE OF HUMAN ACCOMPLISHMENTS (Arts and Humanities and Science and Technology Items)	Students are asked to demonstrate recognition of persons, theories or ideas, works, inventions or phenomena. Students are expected to be able to recognize the names of prominent persons and concepts to which they should have been exposed within the school setting.	60 (15)	What area is most closely related to the following? N.A.T.O. SWAN LAKE RALPH BUNCHE LOUISA MAY ALCOTT GEORGE GERSHWIN NORMAN ROCKWELL EUCLID HOOKE'S LAW	M = Music or Dance S = Science, Math or Medicine V = Visual Arts L = Literature or Drama G = Government or Politics ? = Don't know
INFORMATION USAGE (Analytical thinking)	Students are asked to show that they are able to examine problems in a logical way, to identify them properly, to seek whatever information is needed to establish facts, to be aware of the consequences of decisions, and to have the ability to choose courses of action which are most congruent with their own values and desires.	32 (8)	John will soon graduate from high school. He is thinking about going to college. His parents do not have enough money to pay for this. His uncle has offered him a job which pays well. John knows he would enjoy this job because he would learn a great deal about the kinds of things he would study if he went to college. But, John still wants to go to some kind of school. He reads an advertisement in a magazine about a training program offered by the ABC Training School. This school says that it has trained thousands of people for high-paying careers. The cost of their training program is $2,000. Which of the following is likely to be the least use to John in finding out how good the ABC training program is?	A Read more magazine advertisements about the school. B Contact the Better Business Bureau office nearest the school. C Talk to students who have graduated from the training program. D Talk to possible employers of the school's graduates.

Note: The number appearing in parenthesis indicates the number of items per form.

APPENDIX G

EQA STATEWIDE ITEM DATA FOR PERFORMANCE GOAL AREAS

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STATEWIDE ITEM DATA

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SELF-ESTEEM

Form A	Strongly Agree	Mostly Agree	Mostly Disagree	Strongly Disagree
1. I feel accepted by my classmates.	37*	54	6	2
2. Often in my classes I don't understand what point the teacher is trying to make.	8	25	55	13*
3. I am usually one of the last to be chosen for a group activity.	8	16	47	28*
4. My teachers listen to what I have to say.	19*	60	14	7
5. I feel unhappy about my schoolwork.	11	25	49	16*
6. I feel that my classmates do not consider me to be important.	7	18	47	27*
7. I am able to do many things well in school.	24*	60	12	4
8. I have a low opinion of my learning ability.	6	16	42	36*

Form B				
1. I'm proud of my schoolwork.	19*	60	17	4
2. I often feel that others are better liked than I am.	16	36	38	10*
3. When I do well in school, it is more often a matter of luck than effort.	6	14	49	31*
4. My classmates think I have good ideas.	9*	63	22	5
5. In class I often feel "put down" by my teachers.	6	13	51	29*
6. I can give a good report in front of the class.	14*	38	26	22
7. My teachers usually ignore me.	5	12	53	30*
8. I'm the sort of person who can't do anything in school really well.	5	14	39	42*

Form C	Strongly Agree	Mostly Agree	Mostly Disagree	Strongly Disagree
1. I feel that my classmates have confidence in me.	21*	64	11	4
2. My teachers expect better work from me than I am able to do.	13	29	47	10*
3. I do not make friends as easily as most other people.	7	18	38	36*
4. I am good at picking out the right things to study.	12*	58	23	8
5. Getting good grades depends more on how the teacher feels about me than on how well I do my work.	8	17	44	31*
6. If I win a game, it's usually because I got lucky.	5	16	48	31*
7. I feel that my ideas are considered worthwhile by my teachers.	9*	53	28	10
8. I don't like to tell my ideas in class if I think others will disagree with me.	16	35	32	16*

Form D				
1. If I work at something long enough in school, I will do it well.	50*	43	4	2
2. I often need someone to help me do my schoolwork.	4	17	52	27*
3. I feel accepted by most of my teachers.	22*	62	11	5
4. I keep my ideas to myself in class unless I am sure I'm right.	24	44	24	8*
5. If I don't do well at something in class, it's usually because I didn't try hard enough.	28*	46	19	6
6. I am able to mix well with other people.	35*	53	9	3
7. I often become discouraged in school.	15	30	43	11*
8. My teachers sometimes make me feel that I'm "not good enough."	11	19	45	24*

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CREATIVE ACTIVITIES

During the last three years, how many times have you done the following?

- A = Have not done the activity
- B = Have done the activity once.
- C = Have done the activity 2 or 3 times.
- D = Have done the activity about 5 times.
- E = Have done the activity about 8 times (or more)

Form A

		A	B	C	D	E
1.	Applied what you learned in science to problems you experienced in a natural setting, such as on a hike or camping trip?	35	17	27	8	12*
2.	Written a script for a radio or TV broadcast, play, skit or movie?	71	13	10	3	2*
3.	Developed a new strategy or play for use in a sport?	42	13	20	8	17*
4.	Created a sculpture?	60	17	14	5	4*
5.	Made up an act or routine for an athletic activity, such as gymnastics, swimming, or baton twirling?	48	14	18	8	11*
6.	Played a musical instrument in front of a class or a larger audience, using your own interpretation of the music?	64	11	10	5	10*
7.	Given a humorous or entertaining talk to an audience?	51	18	17	6	8*
8.	Written a science report describing a project that you have done?	28	24	29	10	9*
9.	Made drawings or sketches which express your own ideas?	21	15	23	11	29*
10.	Written a humorous, entertaining or informative speech?	37	18	23	11	11*

Form B

		A	B	C	D	E
1.	Designed a decorative object, such as a mobile, a mosaic or something to hang on a wall?	24	20	34	11	12*
2.	Used your own pattern or your own changes in an existing pattern to design an article of clothing?	61	18	13	4	4*
3.	Written a paper giving a scientific explanation for a natural principle, event or experiment?	34	20	26	9	10*
4.	Designed the plans for a building, bridge or other structure?	68	12	10	4	6*
5.	Written a paper or given a talk explaining your own ideas about an important social issue, such as equal opportunity or the control of nuclear weapons?	45	21	21	8	6*
6.	Performed a dance routine that you worked out for a class or a larger audience?	63	14	11	5	7*
7.	Written the words for a song?	60	16	12	5	7*
8.	Acted in a scene or play using your own interpretation of a part?	57	20	14	5	4*
9.	Written fiction such as a story or a scene from a play?	45	18	20	9	9*
10.	Using your own ideas, developed a social studies project or display?	32	25	27	9	6*

Form C

		A	B	C	D	E
1.	Written a theme or composition expressing your feelings about a personal experience, such as having a pet or seeing something beautiful?	22	17	35	13	13*
2.	Edited or planned a newspaper, yearbook or other publication?	71	13	8	4	4*
3.	Created a painting that expresses your thoughts and feelings about something, such as an event, a place or a person?	54	15	16	6	9*
4.	Developed a plan for promoting a candidate, an activity or a club?	54	18	17	6	5*
5.	Performed an original magic or novelty act?	66	15	10	4	4*
6.	Used your own ideas to prepare a musical arrangement?	68	12	10	4	6*
7.	Written a poem which expresses your own thoughts or feelings?	30	21	23	10	16*
8.	Designed a useful object, such as a piece of furniture, a vase or a quilt?	25	20	29	13	13*
9.	Using your own ideas, developed a science experiment using chemicals or physical principles?	52	19	16	7	7*
10.	Using your own ideas, made up a way to test a scientific theory?	66	15	10	5	4*

Form D

		A	B	C	D	E
1.	Designed and carried out a science experiment using plants or animals?	34	21	28	9	8*
2.	Done layout work for a newspaper, yearbook or other publication?	67	13	10	4	5*
3.	Developed your own recipe or your own changes in a recipe?	48	13	19	7	12*
4.	Designed a plan or organized a group to solve a problem of your community or school?	66	16	11	4	3*
5.	Written the melody for a piece of music?	73	11	7	4	5*
6.	Written a news item or editorial that was published?	75	11	7	4	4*
7.	Sung in front of a class or a larger audience, using your own interpretation of the music?	71	11	9	4	6*
8.	Written a review expressing your own opinion about a book, film or TV program?	42	18	22	9	9*
9.	Using your own ideas, done printmaking or graphic design?	42	17	19	9	13*
10.	Devised a demonstration or made a model or display to show a scientific principle, such as the water cycle or the solar system?	48	25	16	5	6*

CAREER AWARENESS

Form A	Percent Correct
1. Salary and pay	78
2. Occupational terms	68
3. Abilities required	53
4. Abilities required; job functions	33
5. Job functions	80
6. Job functions	43
7. Education and training	47
8. Abilities required	84
9. Job functions	59
10. Occupational clusters	74

Form B	Percent Correct
1. Occupational clusters	57
2. Employment opportunity	50
3. Occupational terms	53
4. Abilities required	18
5. Job functions	30
6. Abilities required	60
7. Abilities required	46
8. Job functions	84
9. Job functions; working conditions	38
10. Job functions	63

Form C	Percent Correct
1. Occupational terms	34
2. Employment opportunity	45
3. Occupational clusters	45
4. Abilities required	50
5. Abilities required	55
6. Job functions	65
7. Employment opportunity	36
8. Job functions; abilities required	78
9. Abilities required	44
10. Job functions	83

Form D	Percent Correct
1. Education and training	49
2. Employment opportunity	58
3. Job functions	64
4. Abilities required	65
5. Occupational terms	65
6. Occupational terms	62
7. Abilities required	69
8. Job functions	75
9. Job functions	73
10. Occupational clusters	56

APPENDIX H

SUMMARY OF EQA CONDITION VARIABLES

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CONDITION VARIABLES

No.	VARIABLE AND COMPUTER CODE	MEASURE	WEIGHTING	INDEX DESCRIPTION
1	GRENROLL (Grade enrollment)	The school administrator reported enrollment of the grade under consideration.	Actual number of students in the participating grade.	A higher value indicates a larger grade enrollment.
2	PCTTILI (Percentage of (Title I) low income students)	The percent of students by school reported to the Department that are from low income families. (DEBE-1169)	Expressed to nearest tenth of a per cent.	A higher value indicates a higher per cent of students from low income families.
3	TUITION (Tuition rate)	The tuition rate established for the school districts was obtained from Department records.	Expressed to nearest whole dollar for 1981-82.	A higher value indicates that the district claims to expend relatively more funds per student.
4	TLOCALE (Teacher locale)	The teachers reported where they graduated from high school.	0= 100 miles or more from boundaries of the school district 1 = More than 30 miles but less than 100 miles 2= In or within 30 miles	A higher value indicates that the school teaching staff is more often drawn from local areas.
5	TSATPAR (Teacher satisfaction with relationships with parents)	The teachers reported how satisfied they were with their relationships with parents and and parent groups	3 = Very satisfied 2 = Somewhat satisfied 1 = Somewhat dissatisfied 0 = Very dissatisfied	A higher score indicates a greater satisfaction of the teaching staff with the cooperation and contacts they have with parents and parent groups.
6	TEDUC (Teacher education)	The teachers indicated the level of formal education they have attained.	4 = Doctor's degree 3 = Master's degree plus 1 year 2 = Master's degree or equivalency 1 = Bachelor's degree 0 = No degree	A higher value indicates that the school's instructional staff reported a higher level of formal education.
7	TEXPER (Teacher experience)	The teachers reported the total years of service in teaching including the current school year.	Expressed as average years' experience.	A higher value indicates that the teachers of the school have relatively more years of teaching experience.
8	CLSIZE (Class size)	The teachers reported their average class size excluding supervisory duties such as study hall.	Expressed as average class size for all teachers.	A higher value indicates a greater average class size.
9	READTIME (Teacher estimation of reading instruction time) (Grade 5 only)	The teachers reported how many hours the average student spent in direct reading instruction in a typical week.	Expressed as average hours spent.	A higher value indicates a greater amount of time spent in direct reading instruction.
10	MATHTIME (Teacher estimation of mathematics instruction time) (Grade 5 only)	The teacher reported how many hours the average student spent in mathematics instruction in a typical week.	Expressed as average hours spent.	A higher value indicates a greater amount of time spent in mathematics instruction.

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No.	VARIABLE	MEASURE	WEIGHTING	INDEX DESCRIPTION
11	EXTRACT (Activities external to the classroom)	The teachers indicated the degree to which each of five statements about their interactions with students constitute a problem in their school.	3 = Not a problem 2 = Moderate problem 1 = Serious problem 0 = Critical problem	A higher score indicates that the teaching staff is more satisfied with their interactions with students.
12	TRELATE (Teacher/Student/Parent relationships)	The teachers indicated the degree to which each of nine statements about the interest of the students and the support and interaction with the parents constitute a problem in their school.	Same as EXTRACT	A higher score indicates that the teaching staff feels that the students and parents support and interact with the school more.
13	DISRUPT (Factors disruptive to classroom management)	The teachers indicated the degree to which each of eight statements about factors that affect classroom management in the school constitute a problem for them.	Same as EXTRACT	A higher value indicates that the teaching staff is more satisfied in classroom management situations.
14	INFLUENC (Teacher influence upon instructional decisions)	The teachers indicated the degree to which each of nine statements about their influence on learning conditions constitutes a problem in their school.	Same as EXTRACT	A higher value indicates that the teaching staff has a greater influence on decisions which affect the instructional processes.
15	TSTAFF (Staff interpersonal relationships)	The teachers indicated the degree to which each of three statements about staff interaction and support constitute a problem in their school.	Same as EXTRACT	The higher value indicates that the teaching staff and other school staff interact better.
16	DISCPROB (Discipline problems)	The teachers indicated the degree to which each of five statements about the discipline procedures of the school constitute a problem for them.	Same as EXTRACT	The higher value indicates that the teaching staff is more satisfied with the way discipline is handled in the school.
17	PAREDUC (Parent education)	The higher level of the following two was used: (1) The students reported the the highest level of formal education attained by their fathers or male guardians. (2) The students reported the highest level of formal education attained by their mothers or female guardians.	8 = Ph.D. or professional degree 7 = Some work toward Ph.D. or professional degree 6 = Master's degree 5 = Bachelor's degree 4 = Some college, vocational, business school after high school 3 = High school graduate 2 = Some high school, but not a graduate 1 = Completed grade school 0 = None or some grade school	A higher value indicates that the school draws students from homes in which at least one of the parents has a higher average level of formal education.

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No.	VARIABLE	MEASURE	WEIGHTING	INDEX DESCRIPTION
18	PAROCC* (Parental occupation)	The highest level of the following two was used: (1) The students reported the occupation most like their fathers' or male guardians found on a list of 148 possible occupations and 6 special categories. (2) The students reported the occupation most like mothers' or female guardians (if employed) on the list of 148 possible occupations and 6 special categories.	The occupational categories were weighted from 1 to 99 according to a combination of education needed to secure the occupation and income derived from the occupation. The higher level was used to allow for family support by either the male or female parent.	A higher value indicates that the school tends to draw a large proportion of its students from homes where the higher level parent is employed in higher-paying jobs requiring higher educational levels.
19	OCDESIRE* (Occupational desire) (Grade 11 only)	From the list of 148 occupations mentioned above, the students reported the occupations most like those they wish to follow when finished in school.	Same weighting used in PAROCC above.	A higher value indicates that the students desire to attain higher paying jobs requiring a higher educational level.
20	OCEXPECT* (Occupational expectation) (Grade 11 only)	From the list of 148 occupations the students reported the occupations most like those they really expect to follow when finished in school.	Same weighting used in PAROCC above.	A higher value indicates the students expect to attain higher paying jobs requiring a higher educational level.
21	PCTGIRLS (Percent girls)	The students indicated their sex.	Expressed in percentage.	A higher value indicates that the school has a greater proportion of girls in the grade level.
22	RESIDE (Type of community)	The students with the aid of the monitor reported the types of communities in which they were then living.	7 = In Philadelphia or Pittsburgh 6 = Inside a large city (100,000 to 500,000 people.) 5 = Inside a medium size city (10,000 to 100,000) 4 = In a suburb of Philadelphia or Pittsburgh 3 = In a suburb of a large city 2 = In a suburb of a medium size city 1 = In a small town (less than 10,000 people.) 0 = In the open country or in a farming community.	A higher value indicates that the students reside in larger areas of dense population, i.e., more removed from open space.
23	PCTWHITE (Percent white students)	The students reported their race.	Expressed in percentage.	A higher value indicates that the school has a greater proportion of white students in the grade level.
24	LIBRARY (Accessibility of library)	The students reported how often they were able to use the school library.	3 = More than three times a week. 2 = Two or three times a week. 1 = Once a week 0 = Never	A higher score indicates that the students report greater accessibility of the library.

*The occupational weightings were updated and no direct comparisons of raw scores can be made to assessments conducted prior to 1978.

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No.	VARIABLE	MEASURE	WEIGHTING	INDEX DESCRIPTION
25	STABLE (Stability of student residence)	The student reported the number of different school buildings attended within the past 3 years because family changed residence.	4 = My family has not moved within the past 3 years 3 = 2 school buildings 2 = 3 school buildings 1 = 4 school buildings 0 = 5 or more school buildings	A higher value indicates that the students come from families which are more stable.
26	FAMSIZE (Family size)	The students reported the number of brothers and sisters they have.	Expressed as average number of siblings.	A higher value indicates that the students of the school come from larger families.
27	FAMORDER (Family order)	The students reported the number of older brothers and sisters they have.	0 = 2 1-2 = 1 3-9 = 0	A higher value indicates that the students of the school are more likely to be the eldest in their families.
28	SPARINT (Student perception of parental interest in school)	The students reported their opinions on three items: (1) My parents enjoy hearing about school. (2) My parents feel the school is doing a good job. (3) My parents support what the school does.	3 = Almost always 2 = Usually 1 = Sometimes 0 = Almost never	A higher value indicates that the students felt their parents have a great interest in the school, a higher opinion of the work of the school, and greater support of the school.
29	HOMEWORK (Amount of homework)	The students reported their estimates of time usually spent on homework from the time they get home from school until they go to bed.	4 = About three hours or more 3 = About two hours 2 = About one hour 1 = Less than one hour 0 = None	A higher value indicates that students of the school spent more time on homework on school nights.
30	TVWATCH (Student time spent watching television)	The students reported their estimates of time usually spent watching television from the time they get home from school until they go to bed.	4 = About five hours or more 3 = About four hours 2 = About three hours 1 = About two hours 0 = About one hour or less	A higher value indicates that students of the school watch more television on school nights.
31	PAREXP (Student perception of parental expectations) (Grades 8 and 11 only)	The students reported their perceptions on: (1) What do your parents encourage you to do? (2) How much schooling do your parents expect you to complete?	For item 1: 3 = To be one of the best students in the class 2 = To be above average student in the class 1 = To be at least an average student 0 = To do just well enough to get by. For item 2: 4 = Beyond college graduation 3 = Graduation from college 2 = Some college or other post-high school training 1 = Graduation from high school 0 = Some high school	A higher score indicates that the students feel that their parents expect them to do well in school and expect them to achieve higher educational levels.

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No.	VARIABLE	MEASURE	WEIGHTING	INDEX DESCRIPTION
32	EDEXPECT (Student educational expectations) (Grades 8 and 11 only)	The students reported how far they expect to go in school.	4 = Beyond college graduation 3 = Graduation from college 2 = Some college or other post-high school training 1 = Graduation from high school 0 = Some high school	A higher score indicates that the students of the school have higher educational expectations.
33	STEACHEX (Student perception of teacher expectations) (Grades 8 and 11 only)	The students reported their perception of their teachers' expectations of them.	3 = One of the best students in the class 2 = Above average in the class 1 = At least an average student 0 = A below average student	A higher score indicates that the students of the school feel that teachers expect more effort from them.
34	HOMEREAD (Reading material in the home)	The students reported on five items the amount of reading materials in the home.	Each item was assigned a weight for the amount of that type of reading materials in the home.	The higher value indicates the students report more reading materials in the home.
35	HOMECLIM (Home climate)	The students reported their opinions on 12 items about home conditions. (3 per form)	Very true of me Mostly true of me Mostly untrue of me Very untrue of me	A higher value indicates that the students have more favorable attitudes toward their home conditions.

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